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ROCK PRODUCTS

November 1945

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FT. WORTH SAND AND GRAVEL CO. WINS ROCK PRODUCTS NATIONAL SAFETY TROPHY

DEC 29 1945

ONE "SLUGGER" .. does a "whale of a job"

SPEEDY REDUCTION at LOW COST . . .

The above open view clearly shows some of the outstanding "Slugger" features. Notice the heavy-duty manganese steel hammers, 1" thick liners and breaker plates, the powerful drive shaft, the dust-tight waterproof housings on two heavy-duty, self-aligning roller bearings. These and other features are reasons why you can rely on the "Slugger" to reduce more tonnages at low operating costs.

ONE Williams "Slugger" does such a thorough job that it eliminates the need for other primary or secondary crushers. It will reduce stone weighing up to 75 and 100 pounds to 1¼", ¾", or agricultural limestone *in one operation.*

"Sluggers" are built of the strongest materials and *by themselves* do a whale of a reduction job, whether the product desired is specification agstone or cubical-shaped aggregates free from slivers or elongated particles.

The "Slugger" Crusher and Pulverizer gives you not only speed, but also 100% efficiency and economy. Every producer, whether large or small, can profitably install a Williams Crusher. Write for information today.

THE WILLIAMS PATENT CRUSHER & PULVERIZER CO.

800 ST. LOUIS AVE. ST. LOUIS 6, MO.

WILLIAMS FINE GRINDING EQUIPMENT WITH AIR SEPARATION

Write today for our Bulletin No. 621 on how to get faster, more efficient fine grinding of limestone, lime, coal, talc, etc. There is a Williams Roller Mill with Air Separator to fit your requirements. Finenesses from 100 to 400 mesh. We also build Impact Mills with Air Separation; Mechanical Air Separators for classifying finely ground material or taking the fines out of dry material.

ALL FROM ONE SOURCE

CHAINS, CONVEYING & ELEVATING UNITS, POWER TRANSMISSION MACHINERY

LINK-BELT

● As specialists in the design, manufacture and application of materials handling and power transmission machinery for all industries, Link-Belt engineers have learned how to apply an extensive knowledge and experience, effectively, to the solution of all kinds of materials handling and power transmitting problems. Some of the many Link-Belt products are here illustrated. Let Link-Belt engineers recommend the types of chains, conveyors, preparation equipment or power transmission machinery which will assure the most efficient production. Send for catalogs.

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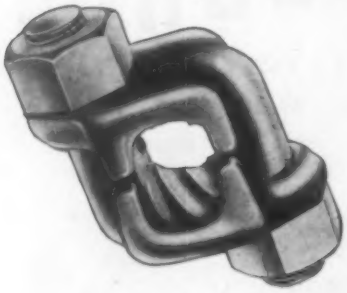
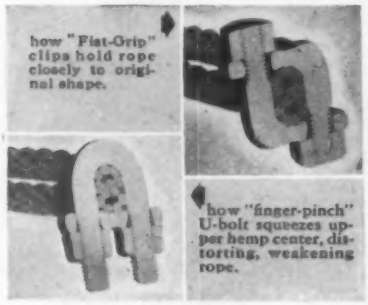
PROTECT

BETTER, PREFORMED ROPE WITH BETTER

"FIST-GRIP" CLIPS



Cross-section views (nuts tightened to same tension by torque-indicating wrench) show—


how "Fist-Grip" clips hold rope closely to original shape.
how "finger-pinch" U-bolt squeezes upper hemp center, distorting, weakening rope.

3 WAYS "FIST-GRIP" SAFETY CLIPS SAVE

1. They Save Skill by eliminating difficult, expensive splicing. Foolproof . . . can't be applied backward or upside down.

2. They Save Metal. Three "Fist-Grip" Safety Clips do work of 4 ordinary U-bolts. Improved bearing surfaces provide more friction. They save rope too because they don't crush or break it.

3. They save time. Easy and speedy to install. Fewer needed. No special wrenches.

Laughlin "Fist-Grip" Safety Clips are ideal not only for preformed wire rope but ordinary wire rope as well. The only clips with drop-forged bolts, their "Fist-Grip" is as strong as rope itself. Distributed through mill, mine and oil field supply houses. For a complete catalog on Laughlin's wire rope and chain hardware, write Dept. 4. The Thomas Laughlin Co., Portland 6, Maine.

LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS

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Carried 12,000,000 tons of material at Shasta Dam without breakdown

B. F. Goodrich cord belt praised by construction chief as it is resold at high price for further use

STARTING at left center and going out of sight in the distance is a small part of the huge belt conveyor system that moved mountains of material for the construction of Shasta Dam. B. F. Goodrich conveyor belting — 17,870 feet of it — had an important place in this big job where conveyor breakdowns meant important time and money wasted.

F. T. Crowe, General Superintendent of Pacific Constructors, Inc., builders of Shasta Dam, had this to say in a letter to B. F. Goodrich: "Of this total, 6,845 feet was of your special cord construction. Much of this belting carried 12,000,000 tons of concrete aggregate and has since been sold and is in use in various industrial plants. In this regard, the cord construction was in so much better condition that *we realized a much higher resale price than on any of the other belting.*"

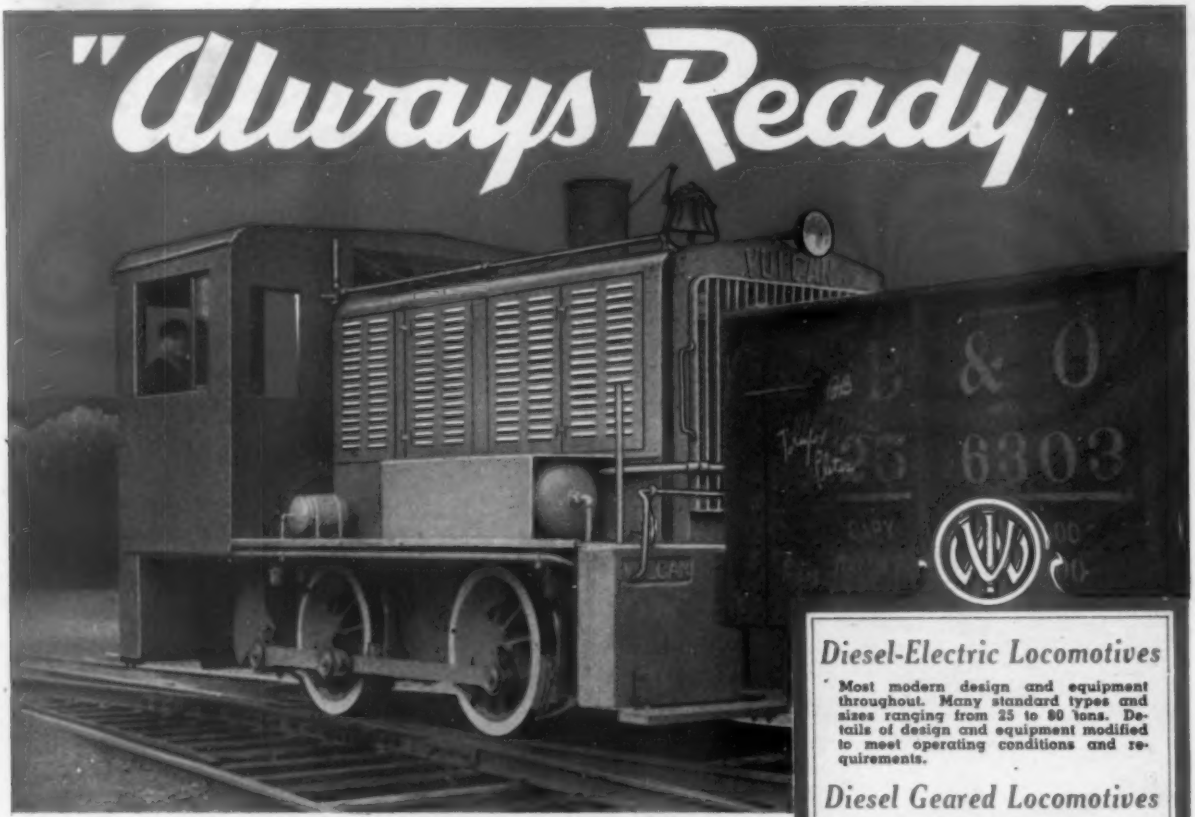
Mr. Crowe goes on to say, "The system on which the belting was used operated 24 hours per day, 30 days per month. We are glad to report that *we did not lose any working time with your belting.*"

Your B. F. Goodrich distributor can tell and show you *why* B. F. Goodrich cord belt is able to give this kind of service consistently — not just once in a while — in coal mines, on docks, in every kind of industrial operation where severe operating conditions require the best and most modern conveyor belt construction for the most dependable, economical performance. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F. Goodrich

RUBBER and SYNTHETIC products

"Always Ready"



THE 35-ton Vulcan Diesel Geared Locomotive shown above switching cars in the yard of a busy defense plant "Has Everything" to assure dependable trouble-free operation, including a distinctive type of Heavy-Duty, CONSTANT-MESH, SPUR-GEARED, TRANSMISSION, with four speeds forward and reverse.

Gear-Stripping is absolutely eliminated and its stepped-type clutch jaws engage so easily that gear changes can be made smoothly at much higher speeds than with the usual system of sliding and clashing gears. Another important and exclusive advantage is DIRECT DRIVE IN HIGH GEAR, which still further reduces gear wear and noise.

Write us regarding any industrial haulage or switching requirement. And remember that a Vulcan locomotive is always a quality product—with an extra margin of durability and trouble-free operating capacity that assures important savings over any prolonged period of operation.

Diesel-Electric Locomotives

Most modern design and equipment throughout. Many standard types and sizes ranging from 25 to 90 tons. Details of design and equipment modified to meet operating conditions and requirements.

Diesel Geared Locomotives

Distinctive Vulcan features include constant-mesh, 4-speed, spur-geared transmission with direct drive in high gear, and separate final-drive gear assembly with side-rod connection to driving wheels. Standard sizes range from 6 to 35 tons. Gasoline locomotives in same range of types and sizes.

Steam Locomotives

All industrial types in a wide range of sizes up to 100 tons. Fuel can be either oil, coal or wood.

Electric Locomotives

Trolley, cable-reel, battery and combination types for underground service from 6 to 30 tons. Load-carrying larries and electric haulage units for industrial service designed and built to meet any specific requirement.

Other Vulcan Products:

include continuous Rotary Kilns, Coolers and Dryers, Crushing Rolls, Pulverizers, Grinding Mills, Briquetting Machines, Electric Hoists, Allcasteel Sheaves, Shaking-Chute Conveyors and other modern equipment for the mining, rock products and chemical-processing industries.

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WILKES-BARRE · PA.

Established 1871

Welded Wire makes Upson-Walton Wire Rope give BETTER Service

Upson-Walton uses the longest lengths of wire in manufacturing all U-W wire rope.

However all lengths eventually end, and they frequently end in the midst of a job. When that occurs, another length of wire must be joined to the original one—and there are two ways to do that.

The first method is called brazing—whereby the wire ends are overlapped and wrapped with bronze wire; heat is then applied until the bronze melts and a connection is effected. The strength of a brazed wire is less than steel because the bronze used to join it is weaker than steel. This is NOT the way Upson-Walton joins wires!

Whenever it is necessary to join two pieces of wire, Upson-Walton *welds* them. The ends are automatically prepared, the machine is set for the correct wire diameter and it automatically controls the temperature and welding pressure. The wires are *fused* together and annealed to remove brittleness and the resulting single wire is *consistently stronger.* The wire is *more uniform* because the human element has been taken out of it—and *more dependable* because it is uniformly strong.

Specify Upson-Walton for the best in wire rope —U-W LAYRITE for *Pre*formed.

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THE UPSON-WALTON COMPANY

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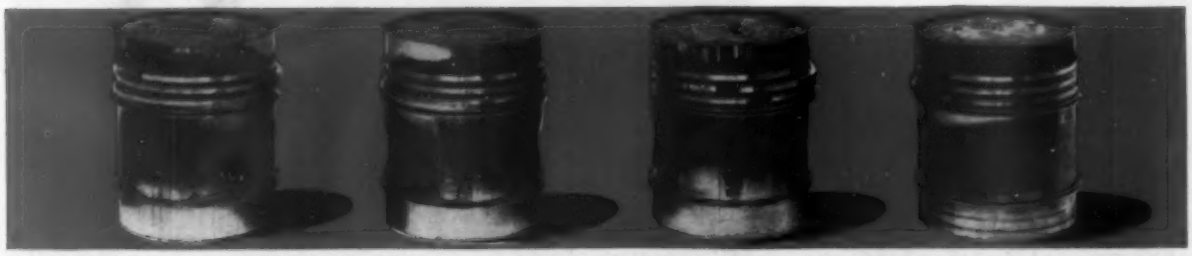
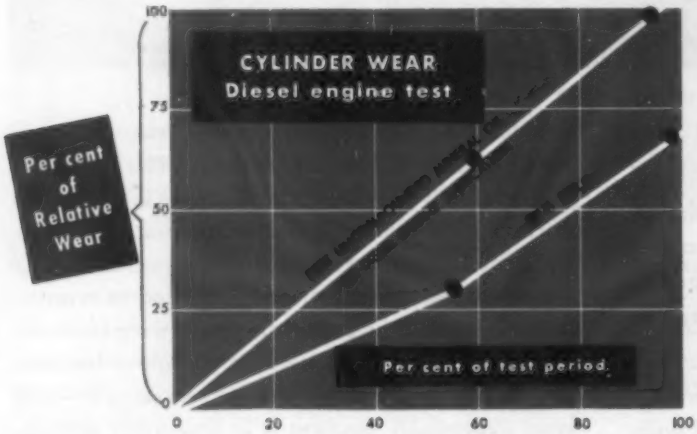
How RPM DELO Oil keeps Diesel pistons clean

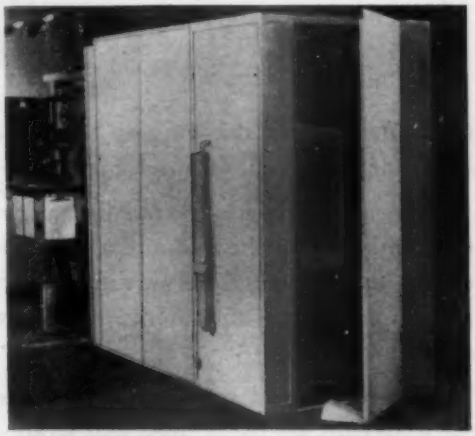


After only 265 hours of operation using the best *uncompounded mineral oil*, these Diesel test engine pistons were coated with a heavy, sticky gum-carbon deposit, as shown in this actual photo. The few bright areas were kept clean by rubbing cylinder walls. Oil ring slots were clogged, and blowby, resulting from stuck rings, caused a deposit of gum to form on cylinder liners. The engine was run on 80% load in a "Hot Box" where the air to the radiator was maintained at 125° F., simulating severe summer operation in high temperature areas.

Run five times longer under the same conditions, using RPM DELO Diesel Engine Lubricating Oil, the same engine's pistons were practically clean, as this photo shows. After 1200 hours, all the rings were free and unstuck. There was no appreciable amount of carbon formation in oil ring slots and the ring grooves were free from carbon deposits. Special, patented compounds in RPM DELO Oil give it this unusual ability to keep engines clean. They resist the formation of gum and varnish, remove deposits and keep contaminants in suspension.



How cylinder wear is reduced by minimizing gum-carbon and varnish formation on Diesel engine pistons through the use of RPM DELO Oil is shown by the above chart. For other charts, tests and a complete technical report on RPM DELO Oil, write for Booklet T-7, Standard of California, San Francisco 20, California.



This "Hot Box" cabinet is used in the laboratory to test Diesel lubricants in engines. It is the one mentioned above. In many devices, RPM DELO Oil is checked under conditions far more severe than are likely to be met in the field.

Detergent compound to clean engine.

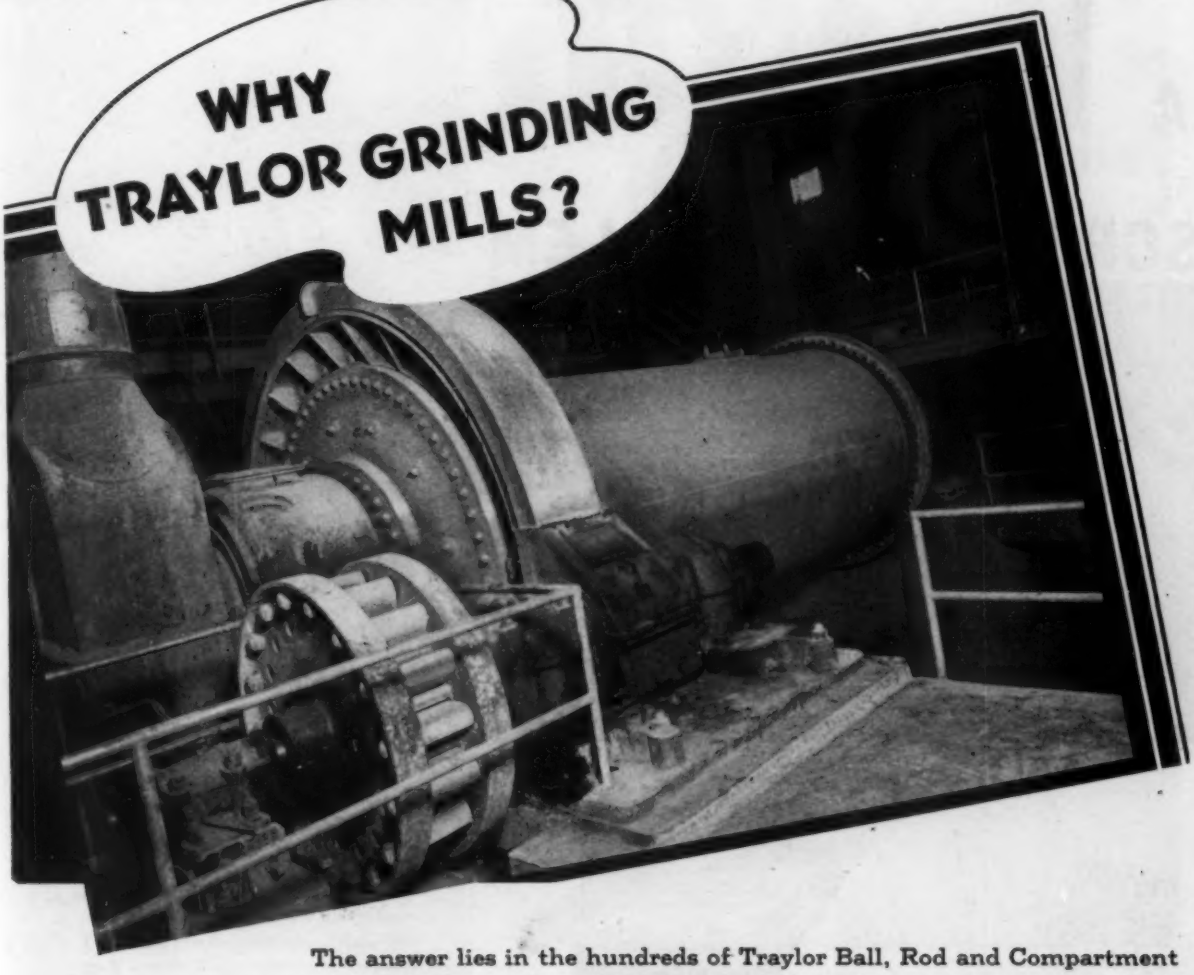
Anti-oxidant to prevent gum and sludge.

Wear-reducing compound.

STANDARD OF CALIFORNIA

RPM DELO Oil has world-wide distribution under the names: RPM DELO, Caltex RPM DELO, Signal RPM DELO, Imperial RPM DELO (CONCENTRATE)

WHY TRAYLOR GRINDING MILLS?



WE BUILD

Kilns
Coolers
Dryers
Slakers
Scrubbers
Jaw Crushers
Gyratory Crushers
Reduction Crushers
Crushing Rolls
Ball Mills
Rod Mills
Wash Mills
Feeders

The answer lies in the hundreds of Traylor Ball, Rod and Compartment Mills that are in use today in the world's leading cement, chemical and process industries where they are "producing the goods."

Into these mills are built ideas of design that are ahead of the times . . . one piece all welded shell, ease of operation, sturdy construction . . . all of which sum up to efficient performance that produces the exact amount of product of the right fineness consistently.

There are, of course, other exclusive features that make Traylor Grinding Mills the preference in these industries.

Ask us to send our representative to discuss these features with you.

Write for Bulletin No. 2103

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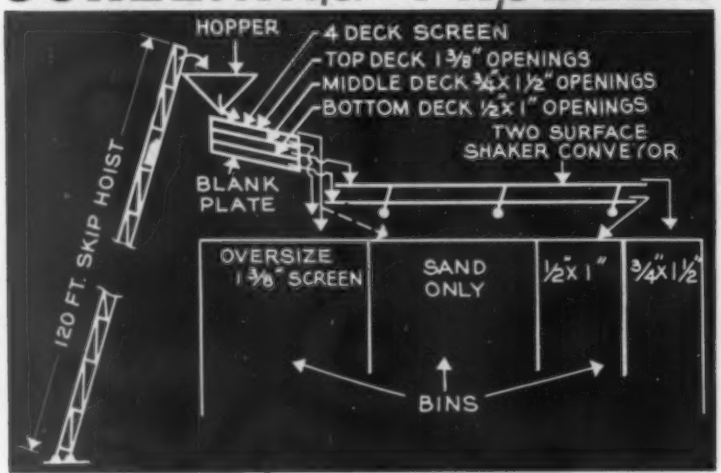
A tough SCREENING PROBLEM



Whether your plant requires standard or special design, Simplicity Gyrating Screens will give you greater operating efficiency—more tons per hour. Separations will be cleaner to closer tolerances with very little upkeep.

These standard Simplicity Gyrating Screen features explain why:

- Counterbalanced eccentric shaft.
- Rubber-mounted screen corners
- Four-way tension over doubly-crowned surface.
- Dust sealed Alemite lubricated bearings.
- Rugged all-steel construction with I-beam frame tied together with rigid steel channels.
- Rubber cushioned power.

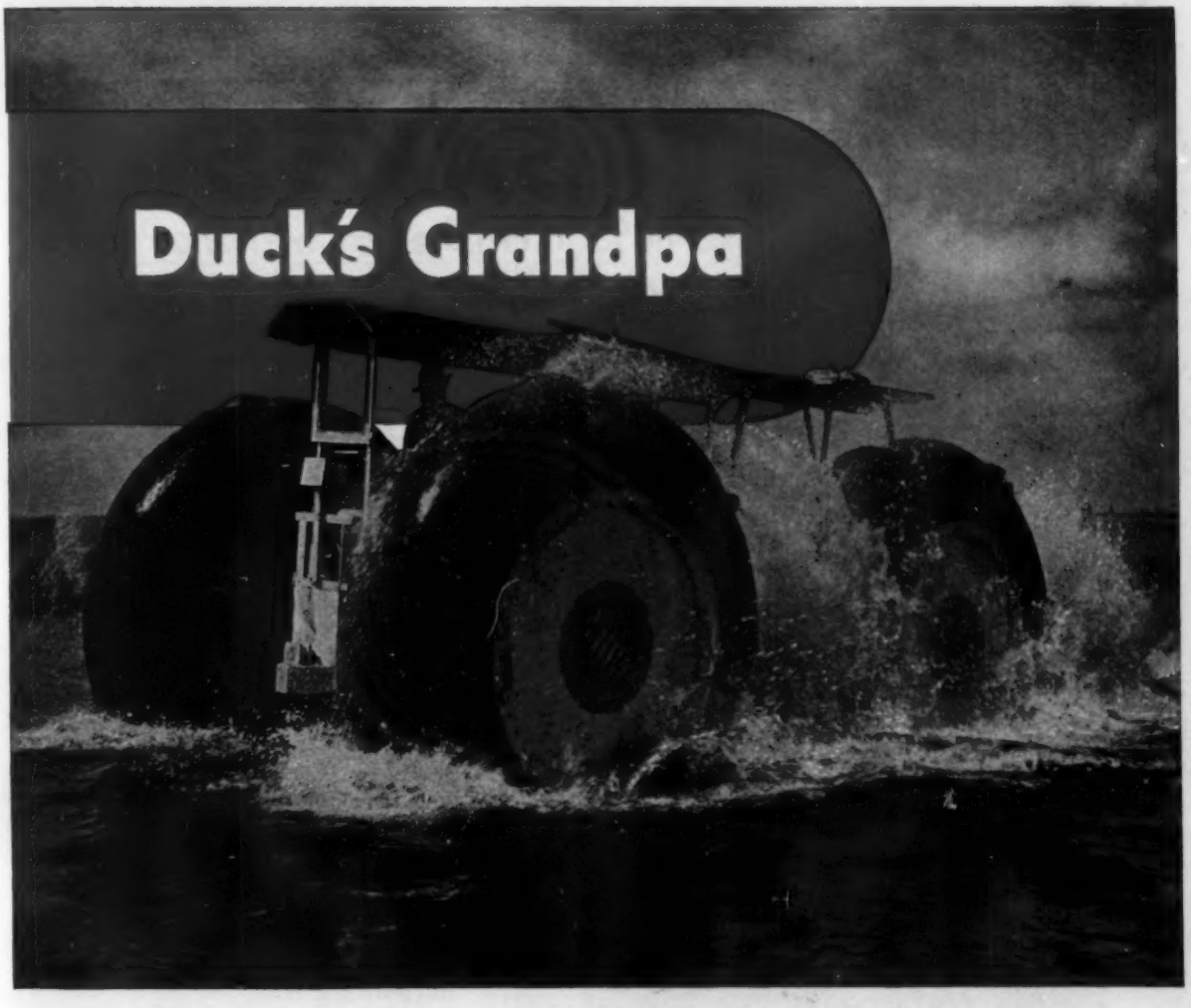
. . . but SIMPLICITY GYRATING SCREENS *provided an outstanding answer . . .*

Recently the Fred Schmitt Material Co., St. Louis, Mo., asked Simplicity engineers to set up a gravel separation system to feed into 120 foot silos. This meant skip-hopper feeding rather than the usual continuous belt type feed. Dangers of clogging and screen damage from heavy material impact were much greater than in the usual installation.

Simplicity's solution, the Model D Simplicity Screen, 3'x10', with solid plate fourth deck, shown in the accompanying diagram, resulted in perfect material flow at rate of one 5,000 pound skip load every 90 seconds — even though at times, 80 per cent of material passed through ½x1 inch screen on third deck.

Write Today for Our Literature Telling the Screening Story

Simplicity
TRADE MARK REGISTERED
ENGINEERING COMPANY
DURAND, MICHIGAN



MEET the grandfather of today's "Ducks," "Weasels" and other amphibious military vehicles—born 10 years ago when Gulf Oil Corporation geophysicists decided to search for oil deposits in Florida and Louisiana swamps.

To get men and test instruments into that soft, gooey marshland, Gulf engineers, with Goodyear development men assisting on the tire-and-wheel plans, designed the vehicle you see above — a self-powered "marsh buggy" shod with big Goodyear balloon tires cross-strapped with lengths of hose that act as traction chains in mud, as paddles in water.

These big Goodyears support and move full loads over dry land and marshland — keep the buggy from sinking into mud and ooze. Equally important, they're sized and calculated for full flotation. More than 3 times larger than car tires, but carrying only 1/10 the air pressure, these big babies are motive water wings, too—buoyant enough to float the buggy and its load when deep water is encountered.

This example of job-engineering adds further proof of Goodyear's ability to build the right tire for any job. For construction work, Goodyear off-the-road tires are designed and built to meet the needs of special operations — the great Sure-Grip for drive wheels, the super-tough Hard Rock Lug for rock work, and the time-proved All-Weather Earth-Mover for general purpose vehicles.

And because these 3 big Goodyears deliver top performance and lower costs-per-ton-mile, they're first choice with cost-wise contractors everywhere. Why not buy — and specify — Goodyears on *your* units?

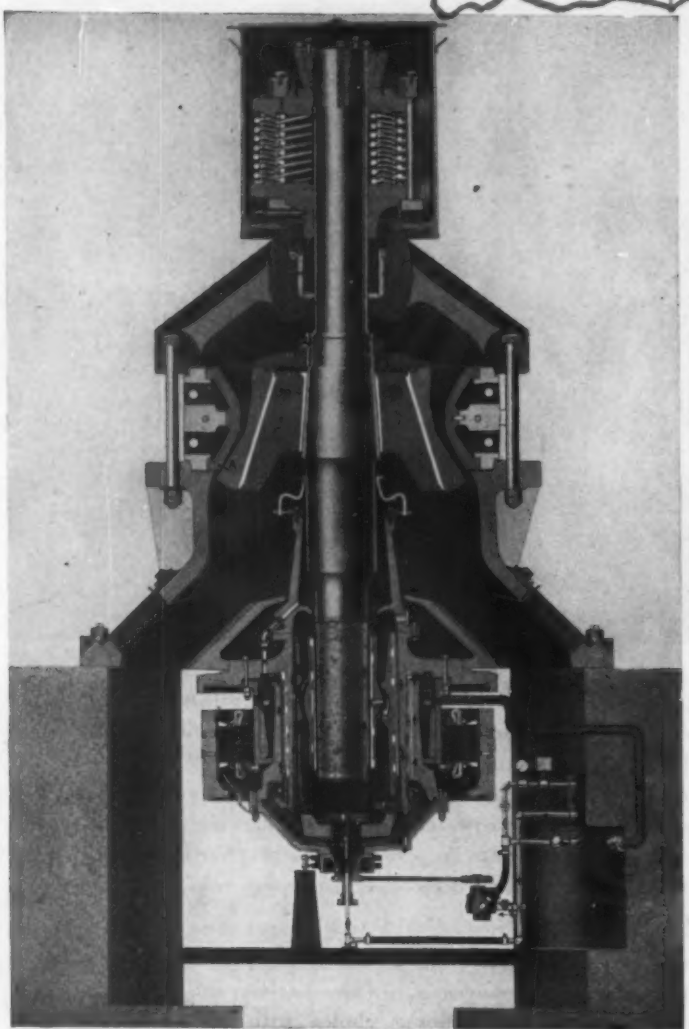
GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

Sure-Grip, All-Weather—T. M.'s The Goodyear Tire & Rubber Company

KVS Engineering SAVES

80% in crusher maintenance costs and 50% in crusher power costs



To show what KVS Engineering means in the machinery you buy we point to one typical example—the Kennedy Ball Bearing Gearless Crusher. The synchronous motor driving this crusher is built right in the pulley assembly. In this way power is applied only for crushing; none is wasted in belts or gears.

This simple, direct and positive application of power has shown 80% savings in maintenance costs and 50% in power over geared crushers. It has produced 145 tons per hour when set to 7/16" between the head and concaves at the bottom. The motor runs on ball bearings and is continuously lubricated by a force feed lubrication system (shown in color in the illustration). The motor is built especially for this crusher.

Kennedy Ball Bearing Gearless Crushers are built in a wide variety of capacities—as standard type, short-shaft, and low head gyratory crushers. They give more uniform sizing, better crushing efficiency, at lowered manganese wear, greater capacity, and reduced power bills. Details of this type crusher are explained in Crusher Bulletin "M" which is available for the asking.

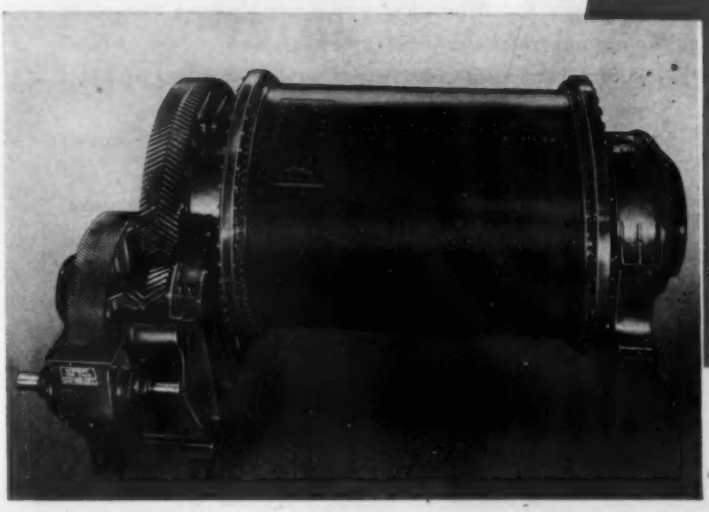
KENNEDY
BALL-BEARING
GEARLESS CRUSHER

KVS **MACHINERY**

KILNS
COOLERS
DRYERS
CRUSHERS
HAMMERMILLS

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

FOR MORE EFFICIENT PULVERIZING OF COAL, CLINKER AND RAW MATERIAL



KENNEDY

INTEGRAL GEAR-DRIVEN

TUBE MILLS

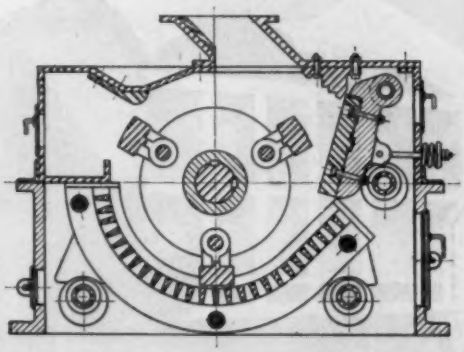
The Kennedy Integral Gear-Driven Tube Mill represents the most advanced and versatile type of mill made. It is being used as rod mill and ball mill—for wet and dry grinding and for air sweeping.

Its design, an exclusive Kennedy patent, enables the motor to be directly connected to the high speed shaft by double reduction herringbone gears or noiseless worm gear. The herringbone gear assembly shown here is carrier on roller bearings, the seats of which are bored in a jig to a tolerance of 3/1000".

Gears cannot be misaligned or set wrong, and this greatly reduces power required to drive the mill. Other features include forced feed lubrication, sound absorbing elements, and electric eye mill level control.

KENNEDY VIBRATING SCREENS

. . . already used in hundreds of plants, give positive action on the screen cloth without transmitting vibration to supporting members. They are made in a wide variety of sizes with single or double decks and to meet any screening requirements. The type of vibration used permits lower speeds for large pieces and higher speeds for small pieces. Material is continually turned over when passing along the screen surfaces. In this way, exceptionally high efficiency is obtained at all times. Standardize on Kennedy Screens.



THE BEST HAMMERMILL FEATURES

are built into Kennedy Roll Hammer Crushers. The Type "E" machine which is diagrammed above is equipped with from three to eight hammers, depending on the material to be pulverized. This machine is easy to adjust while in operation by cam arrangements. The weight of the hammers depends largely upon the diameter of the machine and the material handled. Shafts are carried in ball bearings. Type "E" pulverizes from 75 to 500 tons per hour depending upon the size machine.

SCREENS
FEEDERS
CONVEYORS
ELEVATORS
GRINDING MILLS
CLASSIFIERS
WASHERS

DUST COLLECTORS
AIR SEPARATORS

Complete Cement, Rock Crushing, Sand and Gravel, Lime and Dolomite Plants.

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our catalog and description on these and other types of KENNEDY machinery.

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PAY LOADS THAT PAY OFF

When you find it practical to put one big truck to work in place of several small ones, you have taken a long step toward a permanent reduction in hauling costs . . . *provided* you can depend on it to take a beating and stay on the job.

Your first look at one of the new Ward LaFrance models will indicate what experience as an owner will prove . . . that here's a wholly new standard of truck building for *stamina*. No wonder . . . because it is based on practical experience building the famous Army heavy wreckers built to start their job where other vehicles failed.

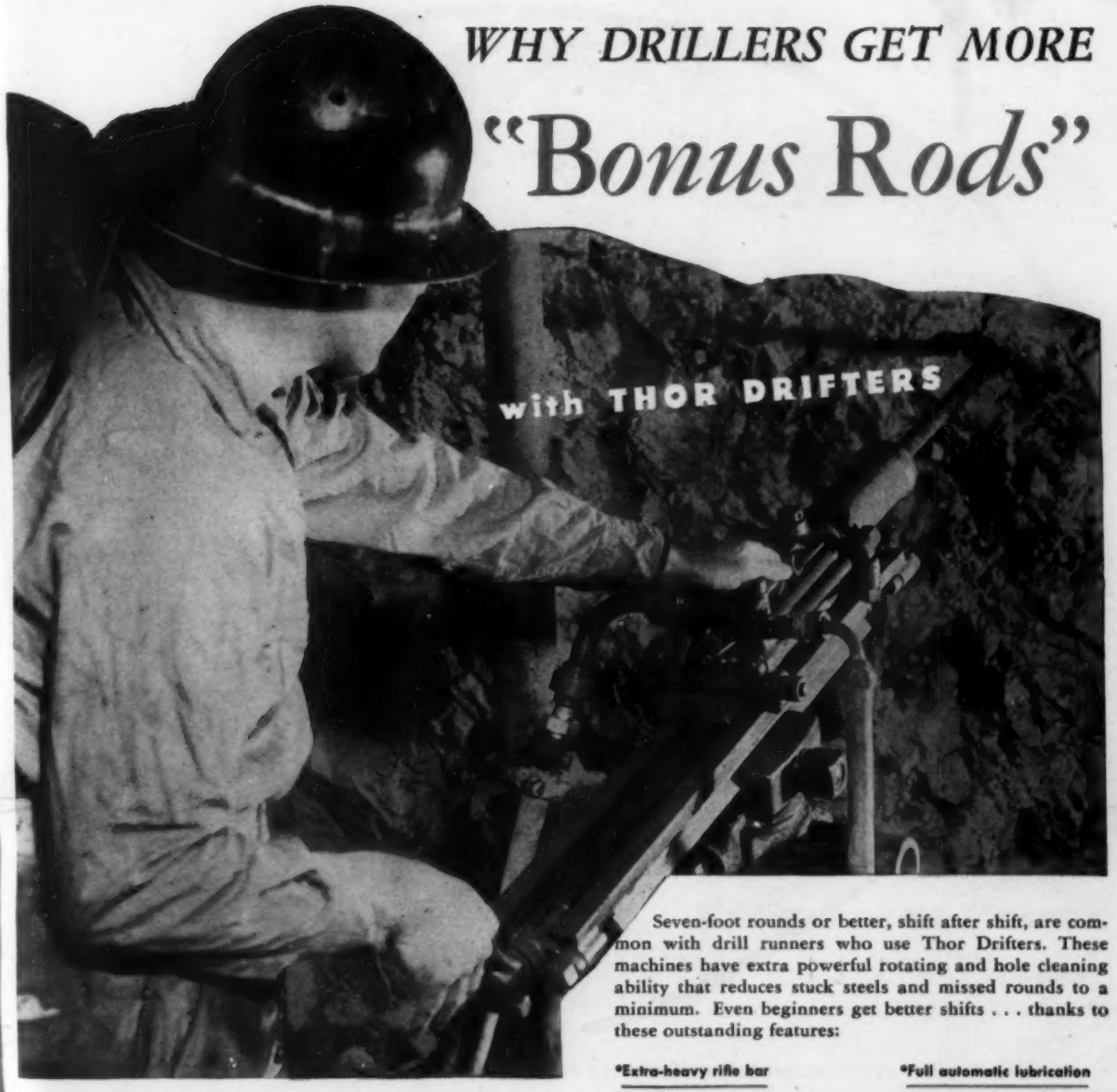
Ward LaFrance trucks are designed and built for heavy hauling on or off the road. Two, four, or six-wheel drive. Look into their practical advantages today. If there is not yet a dealer in your community . . . write direct to Great American Industries, Inc., Ward LaFrance Truck Division, Elmira, N. Y.

A number of valuable franchises are available in high potential territories.

WARD LAFRANCE

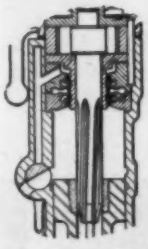
THE NEW STANDARD FOR HEAVY HAULING

WHY DRILLERS GET MORE "Bonus Rods"



Seven-foot rounds or better, shift after shift, are common with drill runners who use Thor Drifters. These machines have extra powerful rotating and hole cleaning ability that reduces stuck steels and missed rounds to a minimum. Even beginners get better shifts . . . thanks to these outstanding features:

- *Extra-heavy rifle bar
- *Full automatic lubrication
- *Short-travel valve
- *Long-wear forward bearing
- *Positive throttle control
- *Rugged retainer
- *Air-cushioned piston
- *Straight-line hole blowing



Extra-Heavy Rifle Bar Assembly Assures Dependable Rotation For Fast Drilling

The heat-treated, alloy-steel rifle bar assembly in Thor Drifters has oversized flutes for extra strength and positive ratchet action. Even in soft or ravelly ground you get dependable rotation for steady drilling.

Made in 3" and 3½" diameter cylinder bore models for light and heavy duty drilling, Thor Drifters can be furnished with hand or power feed to take a variety of sizes and types of steels and mountings. For full specifications on these and Thor Sinker and Stoper Rock Drills, write for catalog No. 42A.

INDEPENDENDENT PNEUMATIC TOOL COMPANY
600 W. Jackson Boulevard, Chicago 6, Illinois
New York Los Angeles

Thor PORTABLE POWER TOOLS

PNEUMATIC
UNIVERSAL ELECTRIC
HIGH FREQUENCY ELECTRIC

It pays to be a Bemis Multiwall Paper Shipping Sack Customer!

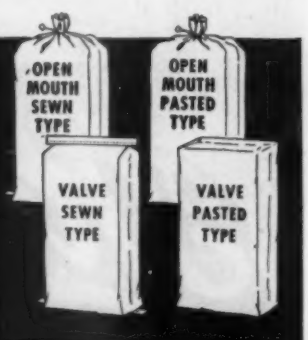
For years, cement manufacturers have said, "It pays to be a Bemis Multiwall Paper Shipping Sack Customer." Wartime conditions brought this fact home in hundreds of instances. • Perhaps the most important reason is that Bemis made an unusual record in fulfilling shipping promises and in maintaining quality under wartime conditions.

Bemis Multiwall Paper Shipping Sacks

Peoria, Ill. · East Pepperell, Mass. · **6 PLANTS** · Mobile, Ala. · San Francisco, Calif. · Wilmington, Calif. · St. Helens, Ore.

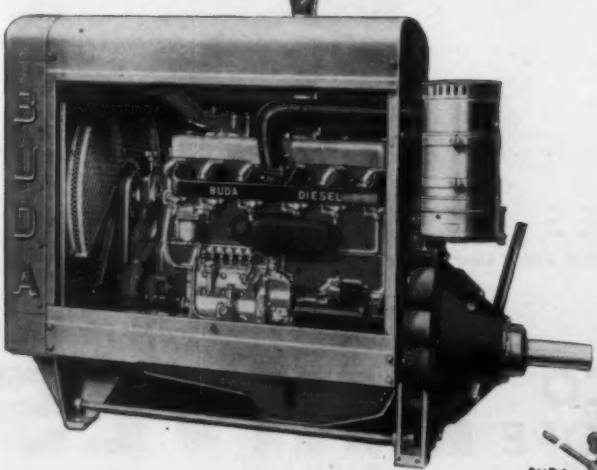
BEMIS BRO. BAG CO.

OFFICES: Baltimore · Boston · Brooklyn · Buffalo · Charlotte · Chicago · Denver · Detroit · East Pepperell · Houston · Indianapolis · Kansas City · Los Angeles · Louisville · Memphis · Minneapolis · Mobile · New Orleans · New York City · Norfolk · Oklahoma City · Omaha · Orlando · Peoria · St. Helens, Ore. · St. Louis · Salina · Salt Lake City · San Francisco · Seattle · Wichita · Wilmington, Calif.



BUDA Experience...

2 cubic yard shovel powered by a modern BUDA Diesel Engine.



...pacing the Progress of Power

BUDA engines of the past were more than adequate for the jobs they had to perform. But time and power requirements move on. BUDA'S 64 years of manufacturing experience and 35 years of engine designing skill all add up to modern requirements. By keeping abreast of industrial needs BUDA has truly paced the progress of power — and will continue to build dependable and economical engines for the peacetime jobs ahead.

BUDA Nozzle Testers

BUDA

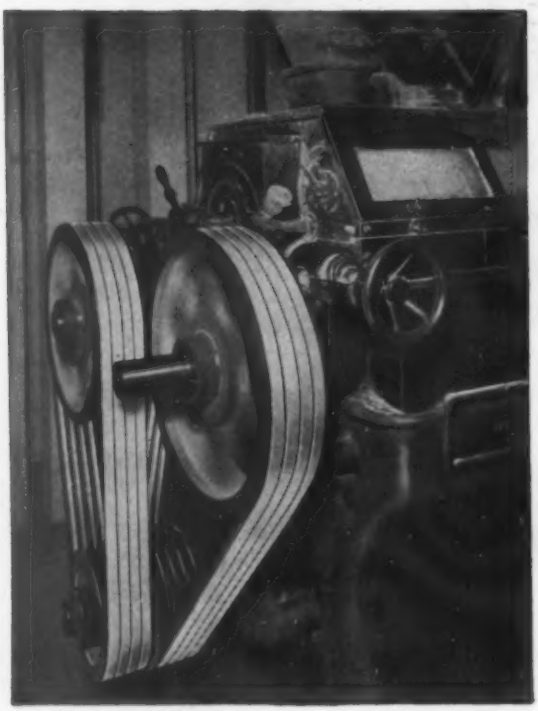
15428 Commercial Avenue
HARVEY (Chicago Suburb) ILLINOIS

BUDA Jacks

The reason for this fact is worth knowing

Your **STANDARD** GATES VULCO ROPES

are TODAY out-performing *ANY* V-Belts *EVER* Built Before!



All Gates V-Belts are Built with The Patented CONCAVE SIDE

During the war, our Army tanks, tractors and self-propelled big guns required, for *combat* service, V-belts built to performance standards never dreamed of before. Gates developed these greatly superior V-belts through intensified, specialized research — and here is what this NOW means to you:—

Here is the reason

● Every improvement developed by Gates for these Army V-belts has also been added, day by day, to the quality of the standard Gates Vulco Ropes which have been delivered to you.

Here is one rare instance in which you have received *immediately* the full advantage of war-time improvements developed primarily for military use. Ordinarily, *you* have to wait. But in the case of Gates V-belts, everyone recognized the vital role they played in maintaining the production that proved so essential in winning the war.

That is why Gates has been able to pass on to you, day by day, every V-belt improvement developed for our armed forces during the war — and that is why your *Standard* Gates Vulco Ropes are today outperforming *any* V-belts ever built before!

Gates

THE MARK OF SPECIALIZED RESEARCH

THE GATES RUBBER COMPANY

Engineering Offices and Jobber Stocks in All Large Industrial Centers

4511

GATES VULCO ROPE DRIVES

CHICAGO 6, ILL., 549 West Washington. NEW YORK CITY 3, 215-219 Fourth Avenue. ATLANTA 3, GA., 521 C. & S. Nat'l Bank Bldg.
LOS ANGELES 21, CAL., 2240 E. Washington Blvd. DENVER 17, COLO., 999 S. Broadway. DETROIT 2, MICH. 223 Boulevard Bldg.
PORTLAND 9, ORE., 333 N.W. 5th Ave. DALLAS 2, TEXAS, 1710 N. Market St. SAN FRANCISCO 3, CAL., 170 Ninth St.

DEPENDABILITY PROVED in a greater variety of applications than *any other diesel*

Proved

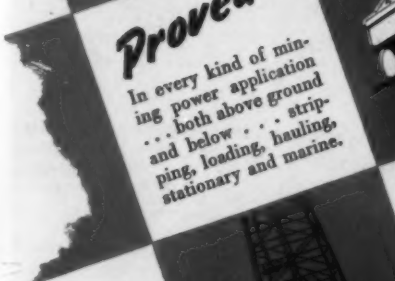
In heavy-duty trucks, both on-the-highway and off-the-highway.

Proved

In all types of heavy-duty earth moving, road building and material handling equipment for contractors and aggregates producers.

Proved

In tugs, ferry boats, commercial fishing boats, fire boats, as well as pleasure craft . . . for both propulsion and auxiliary service.



Proved

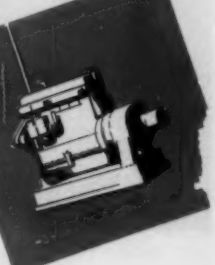
In every kind of mining power application . . . both above ground and below . . . stripping, loading, hauling, stationary and marine.

Proved

In yarders, loaders, trucks, tugs and sawmills . . . in all classes of portable and stationary service . . . on the show and in the mill.

Proved

In rotary rig, cable tool, pumping, generating and well service applications in all of the important petroleum producing areas.



Proved

In locomotives, motor trains, maintenance-of-way and other types of equipment operated by the nation's railroads.

Proved

In the widest range of stationary applications, such as flour and feed mills, ice and refrigeration plants, dairies, cotton gins and many more.

Read the Record

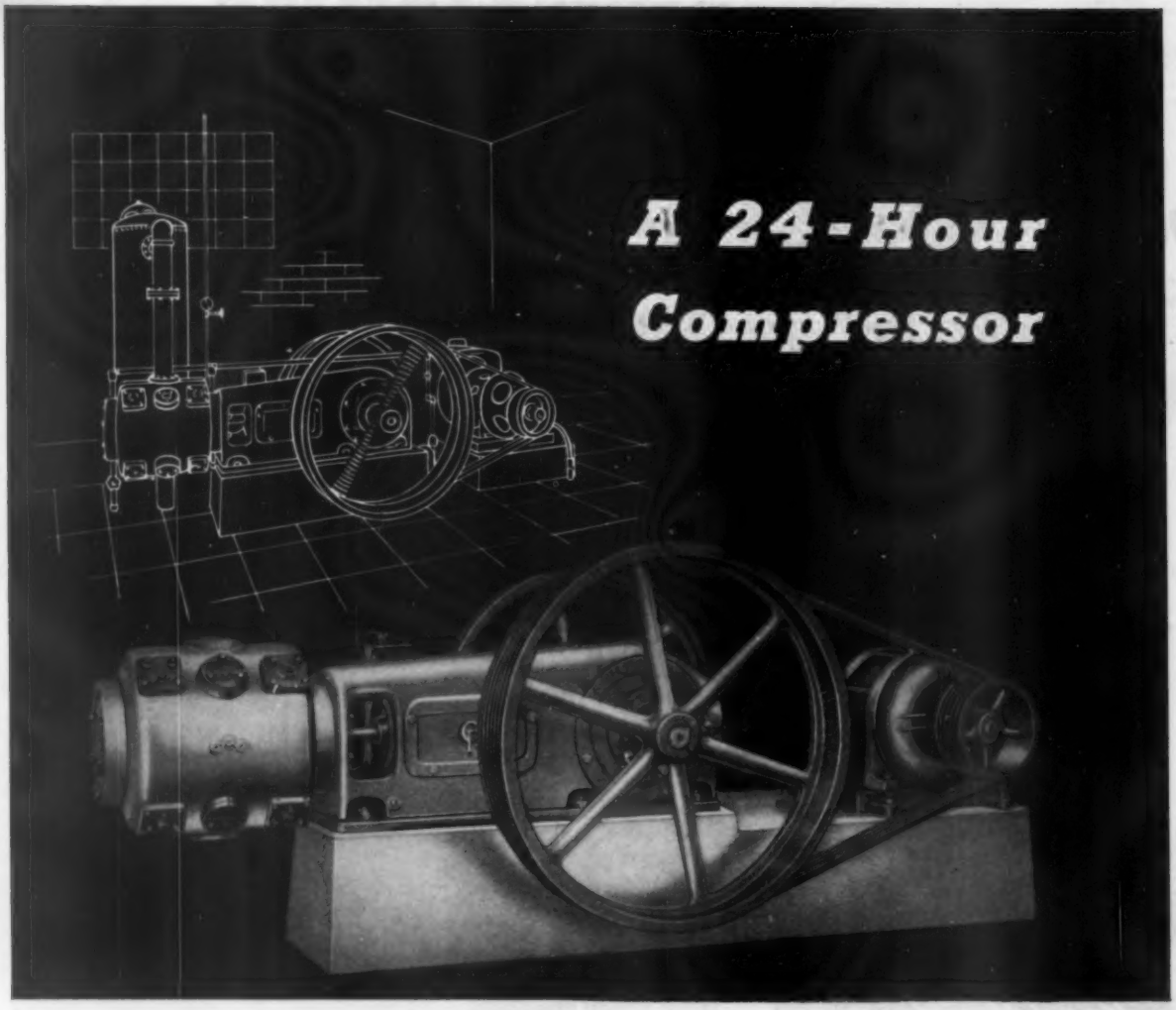
1. More than 90% of the long-line, franchise-operated, heavy-duty, diesel-driven trucks in the 11 Western States are Cummins Diesel-powered.

2. In the world's largest petroleum producing region—the Mid-Continent Area—Cummins Diesels power more rigs than any other diesel engine.

3. More yarders, loaders and trucks in the Northwest Woods are powered by Cummins Diesels than by any other single make of diesel engine.

4. On the Mesabi Iron Range—largest in the world—most of the rubber-tired earth and ore moving equipment is Cummins Diesel-powered.

CUMMINS ENGINE COMPANY, INC.
Columbus, Indiana



with high efficiency...low maintenance

THE CP Type T Compressor is a "wheel horse" for economical, continuous performance...keeps working away, year after year, with minimum maintenance. It is of the horizontal, single-stage, double-acting, water-cooled type, arranged for belt, direct-connected motor or steam drive. Simplate valves, liberal water jackets, one-piece trouble-free crosshead, double-row tapered roller main bearings are a few of the features responsible for its superior performance. Type T Compressors are available in sizes from 15 to 125 hp, in single-stage design for pressures up to 150 pounds, and in multi-stage units for pressures up to 5,000 pounds. Write for Bulletin 728.

★★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
HYDRAULIC TOOLS
ROCK DRILLS

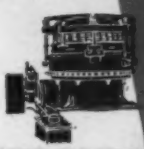
CHICAGO PNEUMATIC
TOOL CP COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

★★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

IS YOUR PLANT READY for *peacetime competition?*

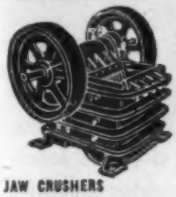
Complete modern Telsmith plant . . . producing both coarse and fine aggregates in several sizes.

PRIMARY BREAKERS

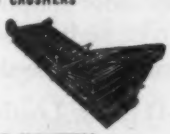


GYRASPHERE CRUSHERS

INTERCONE CRUSHERS

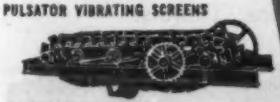


JAW CRUSHERS



SAND CLASSIFIERS

PULSATOR VIBRATING SCREENS



HEAVY DUTY FEEDERS

● RIGHT NOW your plant faces a changed market. Peacetime construction contracts are different. Your customers are different. Competition is keener. This calls for plant planning *now*—for rearrangement and additional equipment. For example, more re-crushing, screening or washing capacity . . . to produce the smaller sizes, in the quantities and quality your market demands. Do this with Telsmith equipment. It gives your plant this necessary product flexibility—boosts its output. Cuts power and maintenance costs. Telsmith equipment keeps your production costs down to a figure that insures you a good profit. Telsmith's 40 years of equipment-building complete-plant-engineering know-how is at your disposal. Write us in detail; or send for Bulletin E-11.

E-4R

TELSMITH Equipment

FOR SAND, GRAVEL AND ROCK CRUSHING PLANTS

SMITH ENGINEERING WORKS, 508 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

51 East 42nd St. New York 17, N.Y. | 211 W. Wacker Drive Chicago 6, Ill. | 713 Commercial Trust Bldg. Philadelphia 2, Pa. | 247 Third Street Cambridge 42, Mass. | Boehck Eqpt. Co. Milwaukee 3, Wis. | Mines Eng. & Eqpt. Co. San Francisco 4—Los Angeles 14

Brandeis M. & S. Co. Louisville 8, Ky. | Rish Equipment Co. Charleston 22, & Clarksburg, W. Va. | Rish Equipment Co. Roanoke 7, & Richmond 10, Va. | North Carolina Eqpt. Co. Raleigh and Charlotte 1, N.C. | Wilson-Woesner-Wilkinson Co. Knoxville 8, & Nashville 6, Tenn.

How a B-G Bucket Loader Can Save Money *the Year 'Round*

Truck loading time is cut to a minimum by the continuous operation of a Barber-Greene Bucket Loader. But more than that, the B-G Loader has year-round utility . . . can hustle along some construction or maintenance job each season.

★ The B-G Loader yields higher yardage, with less power, less weight, and less cost than any other method.

★ It can effectively handle a variety of loose materials—soil, sand, cinders, gravel or roadway debris.

★ Clean pick-up is assured with the follow-up scraper that cuts to grade and does light excavating.

★ Top performance in stockpile or semi-compacted natural deposit loading, light excavating, shoulder shaping or stripping to grade can be maintained with the 12 selective crowding speeds.

★ By substituting a B-G Snow Loader boom, the B-G Loader can be used for street snow removal.

Ask your B-G representative for details on the versatility and economy of B-G Bucket Loaders. Barber-Greene Company, Aurora, Illinois.

45-3

Barber-Greene B G *Constant Flow Equipment*

2 unusual hydraulic presses

that can save you Time, Labor and Trouble

on 101 maintenance, service and special jobs.

RODGERS *Portable* UNIVERSAL PRESS

Left: Here is a Rodgers 200 ton Universal with back plate and rods shown beside it. At right is a Rodgers Universal mounted around a large pitman to pull the shaft. Real power—easy to use!

RODGERS *Flexible* SHOP PRESS

Left: A Rodgers 100 ton Shop Press—study its simplicity — note pins below bed for increasing opening —hand pump mounted on side. Right: A bushing is easily pressed into a sheave with a few strokes of the hand pump.

STOP and think of all the uses you can find for these versatile Rodgers Presses — pulling gears, pinions and wheels; pressing shafts, bushings and pins, squeezing, clamping and jacking operations —wherever you need 50 to 200 tons of easily-applied hydraulic power.

The Rodgers Universal is a unique portable unit for field or shop service. It is used on a stand as an ordinary press, on its side or flat and is easily assembled around equipment for special operations. Rodgers Hydraulic Hand Pump or Power Pump supplies power.

A Rodgers Shop Press is a flexible unit with a bed that is easily raised or lowered to accommodate various size work. Cylinder may be adjusted across entire width of bed. Rodgers Hand Pump or Power Pump furnishes pressure.

If you have equipment to service you can save yourself hours of time and labor with a Rodgers—they often pay for themselves on a tough job or two. Write for *all* the details. It will be profitable.

Send for this new catalog . . .

It will give you complete information on Rodgers Hydraulic Presses. No obligation, of course. Write today.

Rodgers Hydraulic, Inc.

hydraulic power equipment

Shop Presses

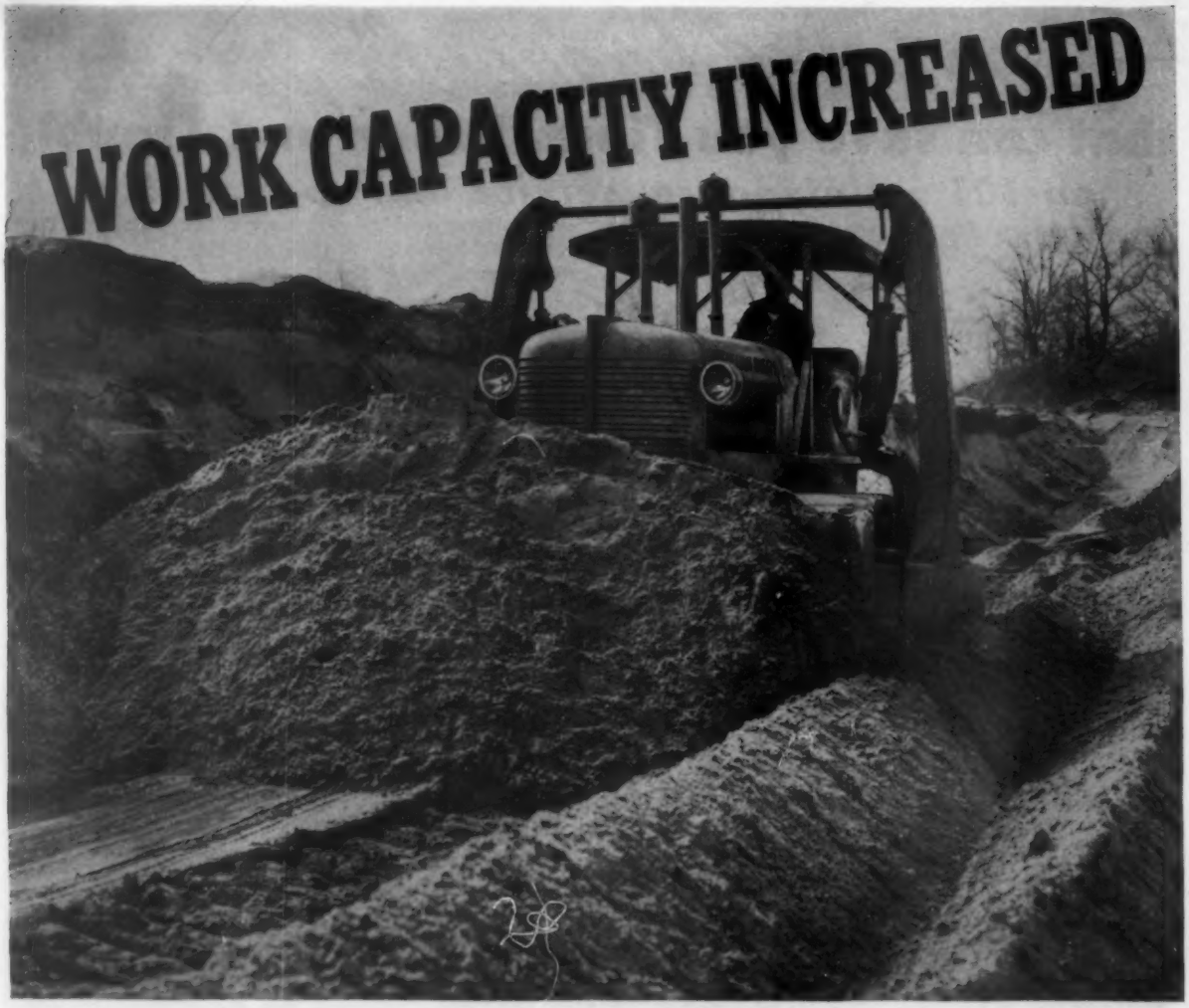
Crawler-Track Presses

7451 Walker St., St. Louis Park, Minneapolis 16, Minn.

Power Pump Units

Portable Presses

WORK CAPACITY INCREASED



Always a top-performer . . . the HD-10 2-cycle Diesel tractor now gives you *more* work capacity. Track is eight inches longer — which means over ten per cent increase in ground contact — MORE TRACTION. Addition of approximately one-half ton in weight, properly distributed for better balance, is another reason for its improved performance. A longer and heavier truck frame and an extra truck roller on each track reduces wear and tear.

Put this new, better-than-ever HD-10 tractor on your stripping, road-building, cleaning-up work. Watch it handle bigger loads faster, move more yardage at less cost per yard. See your Allis-Chalmers dealer. Place your order now for earlier delivery.

Popular Model HD-10 is ideal for bulldozing, operating scrapers, pulling heavy equipment. Provides 86.6 drawbar h.p., has six forward speeds, two reverse.

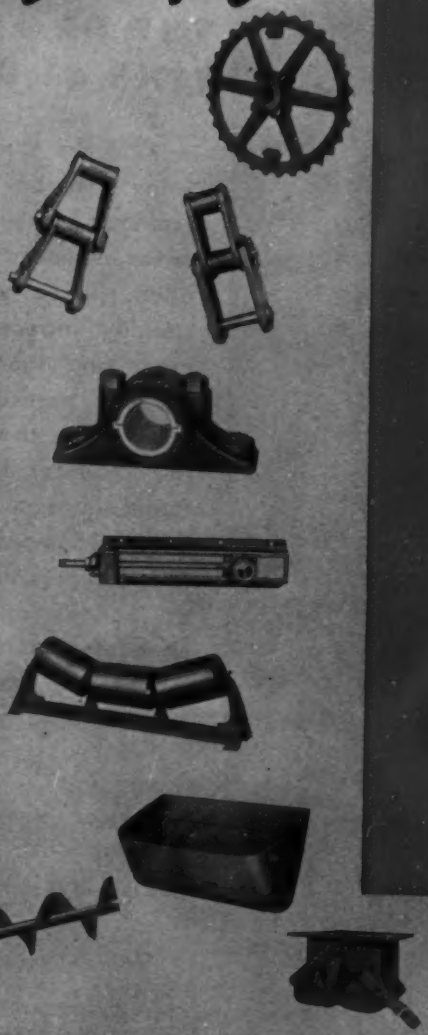
★ ★

HD-10
WITH LONGER TRACK
Gives You —
IMPROVED TRACTION
IMPROVED BALANCE
IMPROVED RIDING
IMPROVED PERFORMANCE

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

try Jeffrey first



1ST for REPLACEMENT Parts

Insure your plant against frequent breakdowns — prevent costly shutdowns of your elevating and conveying equipment by using Jeffrey chains and genuine replacement parts. They are manufactured to precisely the same standards as govern original equipment. We can supply a wide range of maintenance items—can help you develop complete material handling systems. Investigate.

THE JEFFREY MANUFACTURING CO.
935-99 N. FOURTH STREET
COLUMBUS 16, OHIO

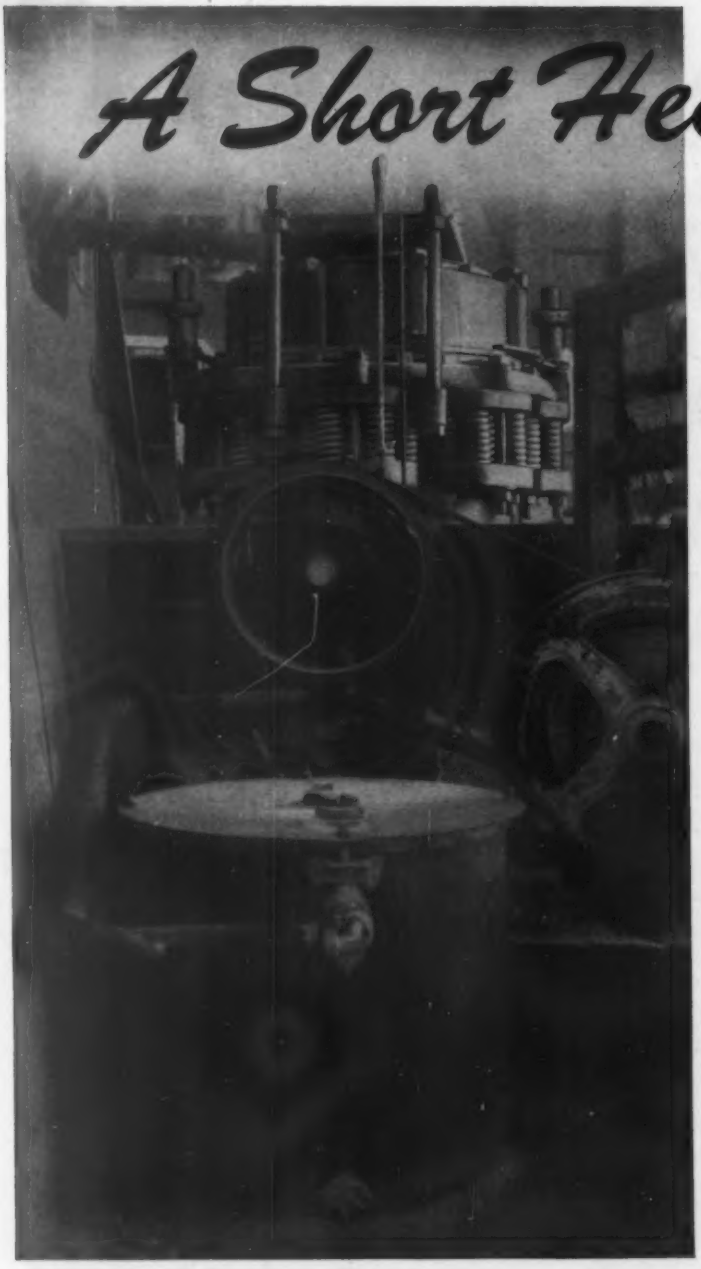
JEFFREY

Baltimore 1
Birmingham 3
Boston 16
Buffalo 2
Chicago 1
Cincinnati 2
Cleveland 13
Denver 2
Detroit 13
Harlan
Houston 5
Huntington 19
Milwaukee 11
New York 7
Philadelphia 3
Pittsburgh 22
St. Louis 2
Salt Lake City 1
Scranton 3

ESTABLISHED 1877

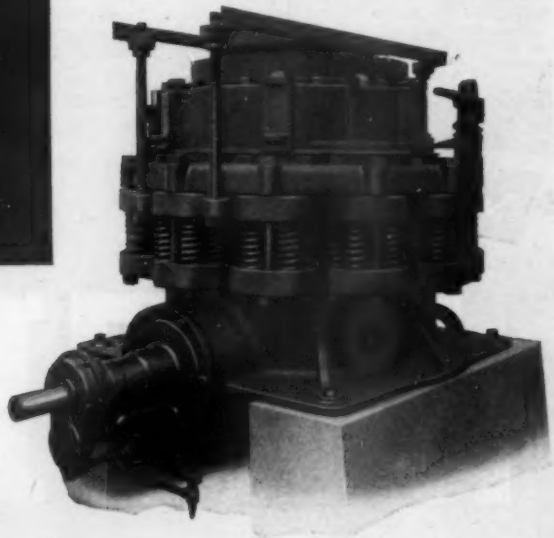
A Short Head Cone

IS THE ANSWER TO THE PROBLEM OF FINE CRUSHING....



In 1928 the Waukesha Lime and Stone Company installed a two foot Standard Symons Cone Crusher for its secondary crushing operation. Recent years have seen a steadily increasing demand for more and more finely crushed products, particularly agstone. To meet these changing conditions, this producer like many others, found the answer in the installation of a Symons Short Head Cone. If your operations call for greater tonnage of minus half inch sizes, follow the example set by leading producers — do your fine crushing with Short Heads.

Three foot Symons Short Head Cone Crusher in the plant of Waukesha Lime and Stone Company, Waukesha, Wisconsin.



NORDBERG MFG. CO.
MILWAUKEE 7, WISCONSIN
NEW YORK · LOS ANGELES · LONDON · TORONTO · JOHANNESBURG

SYMONS CONE CRUSHERS

How fast-acting LIMITAMP CONTROL protects high-voltage motors

TYPE EJ-2 FUSES CLEAR FAULT CURRENTS IN ½ CYCLE

● Limitamp control, with its current-limiting EJ-2 fuses, provides *fast, positive* short-circuit protection for high-voltage squirrel-cage, synchronous, and wound-rotor motors.

When a short circuit occurs, the fuses cut off the rise in current in less than a quarter cycle, and clear the short in less than a half cycle—long before the short-circuit current has time to harm the contactors or motor.

Gives This Lumber Mill Sure, Short-circuit Protection

New Limitamp controls at the Hammond plant are inspected by Lloyd Snook, chief electrician. This factory-assembled group control saves installation time and space as well as materials.

For the newest "packaged" control to protect high-voltage motors, the Hammond Lumber Company of Eureka, Cal., chose fast-acting *Limitamp control.*

Incoming power for the mill is taken directly from the generator bus of a nearby generating station. Therefore, power under short-circuit conditions may run as high as 150,000 kva, making a high degree of protection essential.

Limitamp control, with its current-limiting fuses, provides this protection for all motors in the plant.

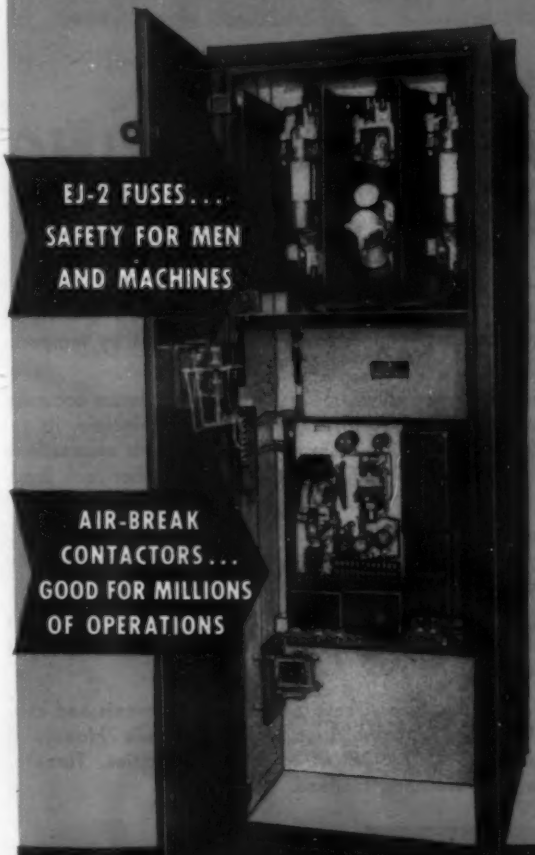
INDUSTRIAL CONTROL

Keep on buying BONDS—and keep all you buy

Other Advantages Limitamp Control Offers YOU

1. *New air-break contactors* meet the most severe requirements of high-voltage motor-control service.
2. *Efficient overload relays,* accurately calibrated against actual motor characteristics, protect your motors from overheating.
3. *Undervoltage protection*—when power fails or voltage is low, the motor is taken off the line and will not restart on return of power.
4. *Silent operation*—EJ-2 fuses are noiseless when they blow.

NEED MORE INFORMATION? Bulletin GEA-4247 gives a complete, illustrated description of Limitamp control. For a copy, contact our local office. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*



GENERAL ELECTRIC

(Left) The Brown Furnace Pressure Controller and (lower right) the Brown ElectroniK Potentiometer installed on a control panel.

The Brown Radiamatic in operation on a rotary kiln.

Control of ROTARY KILN FIRING *Improves Quality*

FOREMOST requirements in firing rotary kilns are measurement and control of product discharge or kiln lining temperatures, combined with automatic kiln pressure control. Quality of product, refractory life and fuel economy are directly related to and controlled by temperature conditions.

BROWN ELECTRONIK, indicating, recording or control Potentiometer, provides maximum accuracy of temperature indication and control. Operating on the *"Continuous Balance"* principle, its response to temperature changes is practically instantaneous. Freedom from moving parts assures long life and continuous service under the abrasive dust conditions found in cement and other rock product plants.

BROWN RADIAMATIC, operating on the radiation pyrometer principle, provides accurate measurement of temperature conditions. Its design insures freedom from effects of high ambient temperatures. Accuracy is unaffected by dust and dirt.

BROWN FURNACE PRESSURE CONTROLLER, Pneumatic Pressure Control System, maintains constant furnace pressure automatically. Operating on the famous Brown Air-o-Line principle, its accuracy and sensitivity provide maximum operating efficiency.

Write for Catalogs No. 5102, No. 15-9 and No. 74-2 describing these advanced instruments and controls in detail. THE BROWN INSTRUMENT COMPANY, a division of Minneapolis-Honeywell Regulator Company, 4444 Wayne Ave., Philadelphia 44, Pa. Offices in all principal cities. Toronto, Canada—London, England—Stockholm, Sweden—Amsterdam, Holland.

BROWN *Electronik* POTENTIOMETERS

SPOTTING THE MARK

That Means LOWEST POSSIBLE COST PER YARD . . . PER TON . . . PER ACRE !

When the time comes to buy new equipment for tomorrow's earthmoving and land clearing jobs, it will pay you to remember the mark LPC, as your guide to lowest possible cost. For LPC stands for LaPlant-Choate —the *job-proved* line of tractor equipment that's known and respected the world over for its outstanding performance on *thousands* of tough jobs. Designed and built by "specialists" with over *34 years* of practical "know-how," LaPlant-Choate equipment will continue to be a step ahead in improvements that assure *lowest possible cost per dollar invested.* LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa.

ALL TYPES OF DOZERS*— Straight or angling blade, hydraulic or cable operated, for every size of track-type tractor.

LARGE OR SMALL SCRAPERS —Hydraulic or cable operated, front or rear dump, for use with wheel or track-type tractors.

CABLE OPERATED RIPPERS— For ripping up hard ground, shale or concrete to facilitate loading with "Carrimor" Scrapers.

LAND CLEARING TOOLS—A complete line of Brush Cutters, Treedozers, Rootcutters and Brush Rakes—all interchangeable.

LAPLANT EARTHMOVING AND LAND **CHOATE** CLEARING EQUIPMENT

* Again in '44, LaPlant-Choate delivered more dozers to the armed forces and other essential users than any other company in the industry—almost as many as all the other manufacturers combined

UNIT 1020

for the TOUGH *jobs*

Consider these exclusive features *not* found in any other comparable crane or shovel:

- New style full vision cab.
- Gasoline engine mounted in straight line with main machinery.
- Drop-forged alloy steel gears and splined shafts.
- Automatic traction brakes . . . no manual control required.
- One-piece cast gear case, simple in design and built as carefully as the finest automotive transmission...dust proof and oil tight.

Compare its low cost and economical operation with any other machine.

FULL VISION CAB
Complete 360 degree visibility at all times. Promotes safety. Increases job efficiency.

Convertible TO ALL ATTACHMENTS

- SHOVEL • CLAMSHELL • DRAGLINE
- TRENCHOE • MAGNET • PILE DRIVER

3/4 YARD SHOVEL

UNIT CRANE & SHOVEL CORP.

MILWAUKEE 14, WISCONSIN, U.S.A.

A 4848-1P-C

"We call this REJUVENATION HEADQUARTERS...

... Where Stoody Self-Hardening Puts Worn Equipment Back on Its Feet!"

OPERATORS are fast learning these facts: There's more life in equipment hard-faced with Stoody Self-Hardening, there's less waste for downtime, lower maintenance costs. It's true for several reasons. Consider wear resistance for example. You can patch those worn bucket bottoms with high carbon or manganese plate but the concentrated, localized wear will soon destroy them again and you've got the job to do over.

The way to get more life from buckets, the way to reduce downtime is to put *extra* wear resistance on fast wearing spots. Deposit Stoody Self-Hardening over those patches, on teeth, lips, runners and wherever abrasion is concentrated. You'll find wear is then more nearly equalized over the entire bucket surface, fast wearing spots are slowed down to the same rate of wear as surrounding areas, total shovel life is greatly improved. And before the Self-Hardening beads are entirely worn off, slap a few more beads over those spots. You'll keep wear at a distance that way, never letting it eat into the parent metal.

Kinks on applying Stoody Self-Hardening are given in Stoody "Specification Sheets." Write for your free copy today! Stoody Self-Hardening is sold for 50 cents per lb., f.o.b. distributor's warehouse or STOODY CO., 1129 W. Slauson Ave., Whittier, Calif.

For building up worn areas before hard-facing with Stoody Self-Hardening, specify the new Stoody Manganese. You'll get greater speed of deposit, easier slag removal, low penetration with high build-up

STOODY HARD-FACING ALLOYS

Retard Wear **Save Repair**

HERE'S WHAT YOU GET WITH A FULLER ROTARY

DIRECT DRIVE

ACCESSIBILITY

LOW MAINTENANCE

SIMPLE FOUNDATIONS

BLADES AUTOMATICALLY COMPENSATE FOR WEAR

SMALL FLOOR SPACE WITH RELATION TO CAPACITY

MAINTAINED CAPACITY FOR THE LIFE OF THE MACHINE

UNNECESSARY BULK ELIMINATED

NO BEARING TAKE-UP

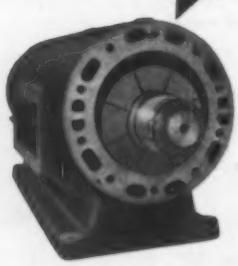
NO LEAKING VALVES OR GRINDING OF SEATS

NO AIR-LINE PULSATIONS

NO MULTIPLICITY OF PARTS REQUIRING FREQUENT ATTENTION, ADJUSTMENT AND REPLACEMENT

Simple Design...Rugged Construction... Efficient Performance

Fuller Compressors are built for capacities to 3300 c.f.m., 125-lb. pressure. Vacuum pumps for vacuums to 29.90-in. (referred to 30-in. barometer).



For many years Fuller engineers have striven to build the best compressor money could buy . . . simple in design, easy to operate, ruggedly constructed for long, continuous service at minimum expense. With these thoughts uppermost in mind, it's natural that only the best of materials and workmanship go into the makeup of Fuller Rotaries. Also designed so that when repairs and inspection do become necessary, the work can be accomplished with the least possible effort and minimum loss of time.

This continued effort has paid dividends, as is shown by the hundreds of machines in daily operation and the many repeat orders from satisfied users.

Before purchasing your next compressor it will pay you to consider the outstanding features of these really efficient machines. Let us send you Bulletin C-5. It's yours for the asking.

FULLER COMPANY, CATASAUQUA, PA.

Chicago 3 - 1144 Marquette Bldg.
San Francisco 4 - 421 Chancery Bldg.
Washington 5, D. C. - 618 Colorado Bldg.

C-135

FULLER

PIONEERS OF HIGH-EFFICIENCY ROTARY COMPRESSORS

Plan NOW to TRAXCAVATE!

IT'S THE MODERN DIRT AND MATERIAL HANDLING METHOD

Model T-4 loading gravel from stockpiles, Albany, New York

One of two T-4 TRAXCAVATORS loading trucks at Pickens Quarries, Oklahoma

Loading limestone in underground quarry, Hershey, Penn.

Your plans to reduce production costs will get off to a flying start if you decide to TRAXCAVATE, for it's the modern material handling method that has enabled many other pits and plants to cut costs. TRAXCAVATORS, the dependable tractor excavators, combine in one machine the usefulness of many — will strip overburden, load from pit or stockpiles, carry and stockpile, maintain haulage roads, remove snow, do drawbar work. There's a wide choice of models with bucket sizes from ½ to 2½ cubic yards. Your TRACKSON-"Caterpillar" dealer will be glad to give you the complete facts, or write to TRACKSON COMPANY, Dept. RP-115, Milwaukee 1, Wisconsin.

LIKE A "300" BOWLER

FORM-SET ROPE IS *Relaxed*

There was the bowler who, on the threshold of the magic 300, went out for a walk before his final roll. Tension was high, but the walk around the block settled his nerves. On the all-important roll, the pins went down and the perfect game was his . . . *because he'd relaxed!*

There's a great deal of that same relaxed quality in Form-Set rope. Form-Set is Bethlehem's preformed, and wire rope in the preformed construction has been relieved of many internal stresses and strains; freed of the locked-in tension that sometimes shortens rope life.

The helical wires don't have a nervous urge to straighten themselves out. Cut a section of Form-Set rope and see what happens. *Nothing.* The wires and strands lie just as they were. They don't pop loose or "wicker."

What's all this add up to? First, longer life (savings for *you*). Second, easy handling (something your *crews* will like). Third, better performance (that's what everybody wants).

Remember—no matter what grade of Bethlehem rope you buy, you can get it in the *relaxed* Form-Set construction.

When you think WIRE ROPE

. . . think BETHLEHEM

SHOVELS
for
ROCK DIGGING

FAST
POWERFUL
VERSATILE
DEPENDABLE
As Only

MARION

KNOWS HOW TO BUILD THEM!

There is a MARION of the proper size, Diesel, electric or gasoline powered, to profitably meet every digging requirement of the Rock Products Industry.

Let us help you with your rock digging problem.

THE MARION STEAM SHOVEL COMPANY

Marion, Ohio

from 3/4 cu. yd. to 40 cu. yds.

Offices and Warehouses in Principal Cities

BE WISE...DON'T LOOK FOR SIZE!

REMEMBER! Its what the Truck Mixer CAN DO... that really counts!

Truck mixer sizes have frequently changed, and will continue to change. But right now, you're primarily interested in what the truck mixer can DO for you . . . how it performs in actual every-day operation.

Smith-Mobile is the ORIGINAL High Discharge Truck Mixer that has long proven its ability to outperform any other truck mixer on the market. Pioneered by Smith 8 years ago and thoroughly job-tested, Smith-Mobile has set the pace for the industry. Constant improvements and refinements have been added, and are being added, from time to time. Today, Smith-Mobile is acclaimed by ready-mixed operators everywhere as the LAST WORD in truck mixer design.

So play safe! Don't take chances with untried truck mixers. Specify the tried and proven Smith-Mobile. Available in four sizes.

Write for Catalog 198-C.

The T. L. SMITH COMPANY
2885 N. 32nd Street, Milwaukee 10, Wisconsin, U. S. A.

Faster gravity flow charging with Smith-Mobile's big, roomy feed chute. No obstructions in chute. No hatch to open or close. Driver can stay in cab.

•

Faster and better mixing. Shrinking and mixing start the instant batch enters drum, because drum rotates during charging operation. Sealing door can be opened wide during mixing cycle. You can look in drum and actually SEE what's going on.

•

Faster delivery of concrete into forms. High discharge. Permits steeper and longer distributing spout. Covers greater area even with dry concrete. Pours concrete directly into high forms, hoppers, buckets or carts. No hoist or ramp required.

SMITH-MOBILE

The ORIGINAL HIGH DISCHARGE Truck Mixer and Agitator

A 4818-1P

Your Industrial Supply Specialist

He's the quartermaster for industrial America. The equipment, tools, supplies and materials he handles require him to be a true specialist in every sense. He knows how those products fit your needs . . . he can tell you where and how they can help you save time and money. He is in business to serve you, and is available night and day to help you eliminate costly shutdowns, repairs, and production "bottlenecks."

We are proud that Hewitt rubber products for industry come to you through men like these. Next time you call your Industrial Supply Specialist ask him how Hewitt "Job-Engineered" industrial hose, belts and molded goods can solve your problems more efficiently . . . at lower cost. He's as close as your phone, and, in your community, you'll find the best Industrial Supply Specialist listed in your telephone directory under HEWITT. Why not call him *now?*

Specify "Hewitt" for quality industrial rubber products. Phone the Hewitt distributor listed in the Classified Section of your telephone directory, or write to Hewitt Rubber Corporation, 240 Kensington Avenue, Buffalo 5, New York.

HEWITT RUBBER *of Buffalo*

Job-Engineered Industrial Hose • Belts • Molded Goods

QUALITY RUBBER PRODUCTS FOR INDUSTRY FOR 85 YEARS

POWER IN ACTION!

This International TD-6 Diesel, equipped with a dozer shovel, is a portrait of *power in action*—where the going is rough.

The tough jobs, the grueling day-in and day-out grinds—these are the jobs where you'll find Internationals. These are the jobs that have proven International stamina and endurance.

International Diesel TracTracTors are engineered for this kind of work. They're better balanced for maximum traction under all conditions. They're powered by mighty Diesels that are always ready to deliver at a moment's notice and carry on until the job is done. Ease of control and a selective range of practical working speeds plus full Diesel economy get the work done at the lowest cost. All these features are responsible for the ever-increasing popularity of International TracTracTors.

See these powerful crawlers at your International Industrial Power distributor's today. Let him give you the whole story about International Crawlers—dynamic and durable power.

INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

INTERNATIONAL Industrial Power

"Primacord helps us stretch our manpower."

Fewer men can accomplish more when Primacord comes on the job. That's why pits and quarries the country over are using it to help compensate for reduced manpower.

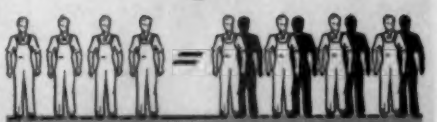
Primacord conserves the time of drillers and equipment handlers. It permits more holes to be shot at one setup — hence, more drilling between equipment moves.

Primacord conserves the time of skilled labor. It is a detonating fuse which ordinary laborers can handle, because sparks, friction or flame will not detonate it.

Primacord conserves the time of powder men. One simple lacing of one cartridge, without a cap, is required for an entire hole, even when decks are employed. Primacord detonates every cartridge it touches. Hooking-up requires simple knots, and a cap for the main line only.

Primacord conserves shovel time. Its more effective use of explosive power gives better fragmentation for easier handling. No caps, no unexploded powder is found in the rock pile when Primacord is properly used.

P-5



4 good men worth double with Primacord

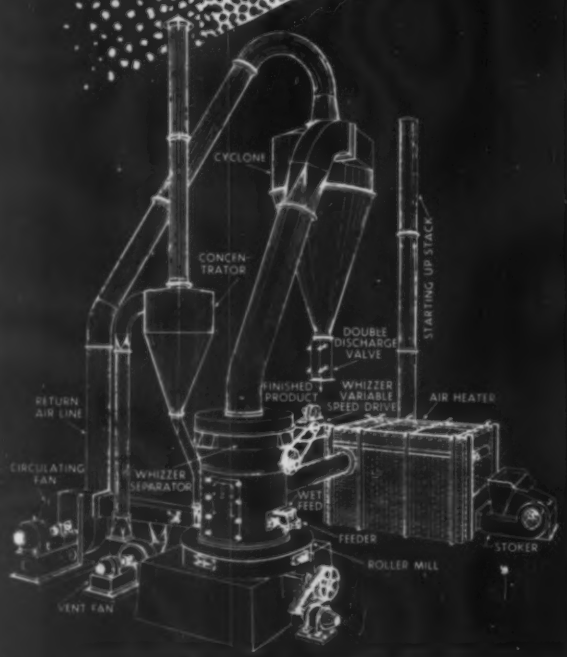
THE ENSIGN-BICKFORD COMPANY • Simsbury, Connecticut

Also
ENSIGN-BICKFORD SAFETY FUSE
Since 1836

PRIMACORD-BICKFORD Detonating • Fuse •

DRY IT as you GRIND IT

that's ONE OPERATION for the Raymond Roller Mill



THE production of *fine, dry, free-flowing materials* is a job best handled by the flash-drying-equipped Raymond Roller Mill.

Take the case of limestone grinding: The High Side Roller Mill with double whizzer separator produces two grades, a primary product at 85% passing 200-mesh for feed purposes, and a secondary product at 99.5% minus 20-mesh fineness for agricultural use. At the same time, the surface moisture of from 5% to 7% is reduced to a final content of less than one per cent.

Another example is gypsum grinding: For this, a Low Side Roller Mill is equipped with flash drying to remove the surface moisture only and at the same time the gypsum is pulverized to a uniform fineness, delivering a fine, dry, free-flowing material to the kettles.

If you are handling any type of non-metallic-minerals, carrying small amounts of moisture, you can dry and grind in-the-mill, and obtain a higher capacity with a Raymond Roller Mill.

Write for Catalog No. 51

SINCE 1887

RAYMOND PULVERIZER DIVISION
COMBUSTION ENGINEERING COMPANY, INC
1307 NORTH BRANCH ST. CHICAGO 22, ILLINOIS

Sales Offices in Principal Cities

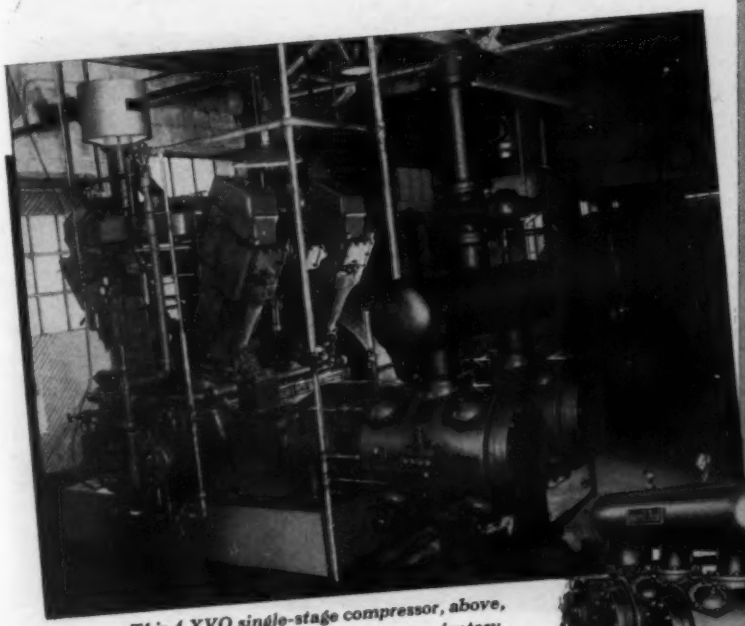
Canada: Combustion Engineering Corp., Ltd., Montreal

Maybe YOU have compressor problems that can be solved with the DIESEL-DRIVEN

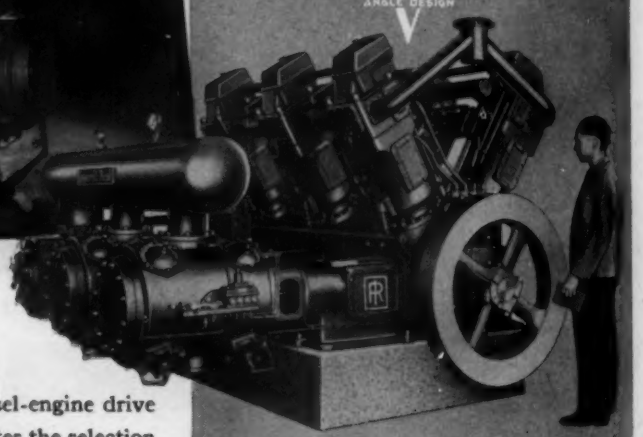
TYPE
XVO

DIESEL-ENGINE AND COMPRESSOR IN ONE MACHINE

ANGLE DESIGN



This 4 XVO single-stage compressor, above, supplies medium-pressure air at a factory. At right is a 6 XVO two-stage compressor.



When economy dictates the selection of Diesel-engine drive for compressors, certainly the same reason dictates the selection of the most economical type.

One gallon of diesel fuel will compress 5600 cubic feet of free air to 100 pounds pressure . . . in an *XVO*. Compare this high over-all economy with any other compressor plant.

The XVO combines a heavy-duty, four-cycle diesel engine and a heavy-duty, double-acting compressor in a single, compact machine. It has fully demonstrated its ability to operate continuously at full load, 24 hours per day, over long periods of time . . . it was built for that purpose.

1 IF YOUR COMPRESSOR PLANT SHOULD BE INDEPENDENT OR ISOLATED.

2 IF ECONOMY IS A PRIMARY CONSIDERATION.

3 IF EXISTING POWER FACILITIES CANNOT CARRY ADDITIONAL LOAD.

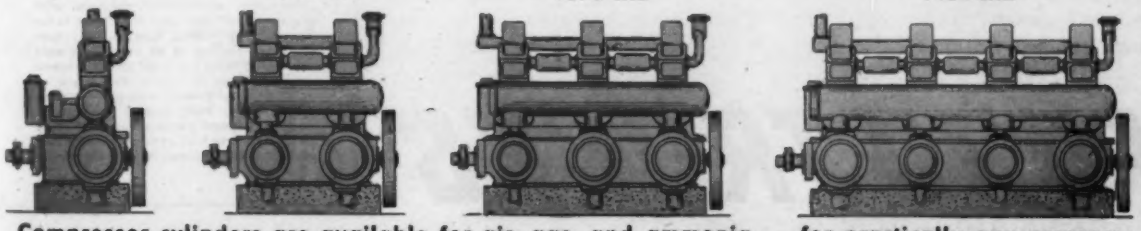
Select the **XVO**

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y. 6-511

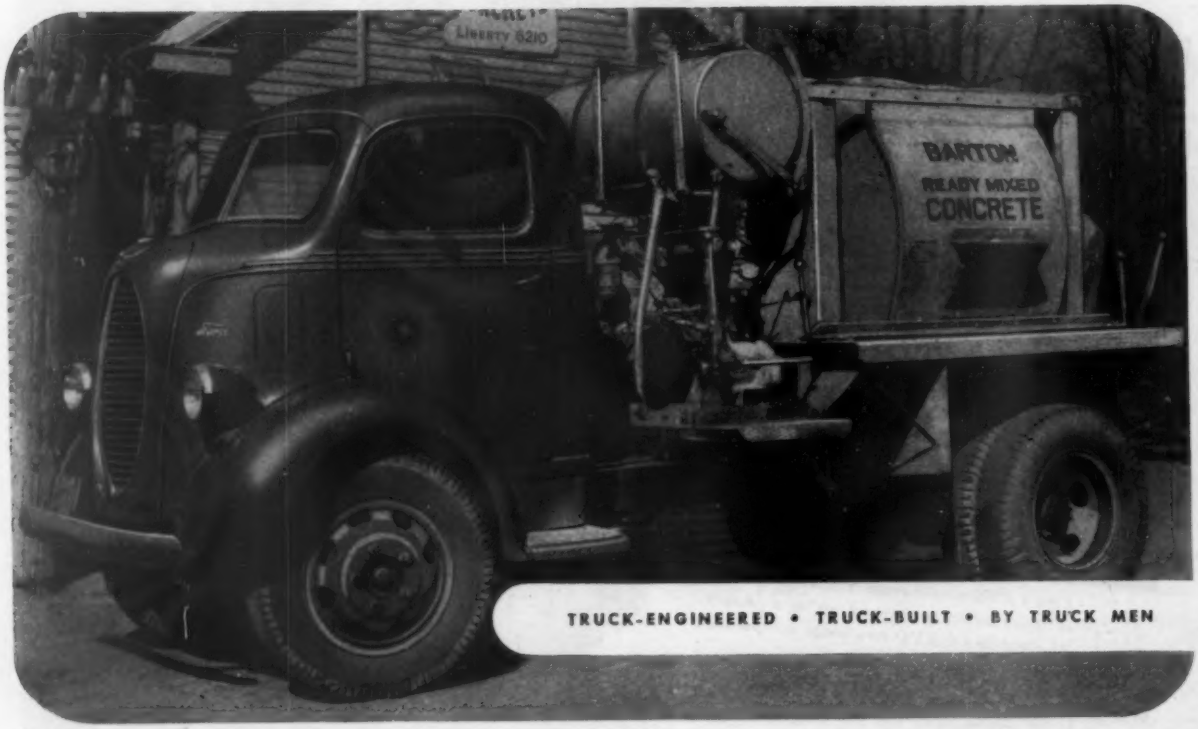
Cfm free-air actual delivery at 100-lb pressure and sea level

335 cfm *700 cfm* *1075 cfm* *1450 cfm*



Compressor cylinders are available for air, gas, and ammonia . . . for practically any pressures

Better Trucks for YOUR Business!



TRUCK-ENGINEERED • TRUCK-BUILT • BY TRUCK MEN

In mixer, tractor, dump service
"Fords mean lower costs, fewer tie-ups"

Because building-materials handling is tougher service than most, it makes the Ford Truck's famous ruggedness and endurance extra-important. And many thousands of men in the sand, gravel and concrete business recognize this. Here's what James P. Barton, general manager of the ALAN E. BARTON Company of Baltimore, wrote about Ford Trucks:

"We operate 20 to 28 mixers, tractors, and dump trucks, 75% of which are heavy-duty Fords. The Ford units have shown lower costs of operation and fewer tie-ups. Through the war, our Ford units have operated under heavy work load and for long hours—always ready to go."

The new Ford Trucks now being built (which include a new dump truck chassis) bring you a great many important engineering advancements. Ask your Ford Truck Dealer to show you these new features, which make the Ford Truck, more than ever, an obvious first-choice for your service.

Ford

ADVANCED ENGINEERING IN NEW FORD TRUCKS

More Economy and Endurance
Easier Servicing

A STILL GREATER 100 HP V-8 ENGINE with NEW Ford steel-cored Silvalay rod bearings, more enduring than ever in severe service • NEW aluminum alloy cam-ground 4-ring pistons for oil economy • BIGGER, more efficient oil pump and IMPROVED rear bearing oil seal • NEW longer-lived valve springs • NEW improvements in cooling • NEW efficiency in ignition • in carburetion • in lubrication • in ease and economy of servicing operations • And available in all truck chassis except C.O.E. units—the rugged, thrifty 90 HP FORD SIX-CYLINDER ENGINE; with many important advancements.

FORD CHASSIS ADVANTAGES: Easy accessibility for low-cost maintenance • Universal service facilities • Tough, forged front axles • Extra-sturdy rear axles with pinion straddle-mounted on 3 large roller bearings, ¾-floating type in light duty units, full-floating in all others • 3 axle ratios available (2 in 1-ton unit) • 2-speed axle available in heavy duty units at extra cost • Powerful hydraulic brakes, large drums, cast braking surfaces • Rugged 4-speed transmission with NEW internal reverse lock optional at extra cost on light duty units, standard on all others.

FORD TRUCKS

MORE FORD TRUCKS ON THE ROAD • ON MORE JOBS • FOR MORE GOOD REASONS

...a peek into the future—

Cedarapids Unitized Plant Economy *for tomorrow's jobs*

These 4 Units Make a Dozen Complete Plant Combinations for ANY Job Needs!

Each element of the Cedarapids Unitized Plant is a complete unit in itself, balanced for high capacity used alone or with other matched sizes to handle every range of production volume.

What a Unitized Plant Will Mean to You

The basic economy of standardized machines capable of instant adaptation to special job conditions needs no explanation to operating contractors. Savings begin in lower purchase costs, and extend straight down the line through maintenance, repairs, and labor-saving flexibility to the ultimate goal of profitable contracts. Working machines are the only money-making machines, and the Cedarapids Unitized Plant is designed to give you the equipment flexibility necessary to keep the good contracts coming in, the plant on the job. Be sure you find out all about Cedarapids Unitized Plants BEFORE you buy your plant requirements for the FUTURE—and what a future it is if you have the right portable plant equipment! See your Iowa Distributor for complete details.

IOWA MANUFACTURING COMPANY
CEDAR RAPIDS, IOWA

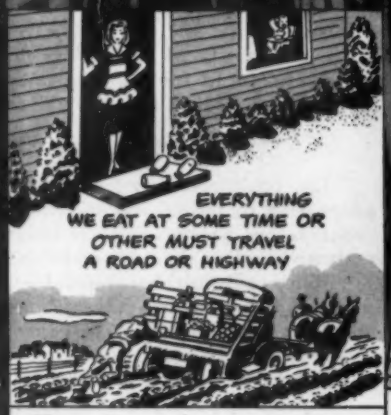
Cedarapids — Built by IOWA

THE IOWA LINE
of Material Handling Equipment Includes

ROCK AND GRAVEL CRUSHERS
BELT CONVEYORS
STEEL BINS
BUCKET ELEVATORS
SCREENS AND REVOLVING SCREENS
STRAIGHT LINE ROCK AND GRAVEL PLANTS
FEEDERS—TRAPS
PORTABLE BUCKET CONVEYORS
PORTABLE STONE PLANTS
PORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
BATCH TYPE ASPHALT PLANTS
TRAVELING (ROAD MIX) PLANTS
DRAG SCRAPER TANKS
WASHING PLANTS
TRACTOR-CRUSHER PLANTS
STEEL TRUCKS AND TRAILERS
KUBIT IMPACT BREAKERS

THE DOCTOR HAS PRESCRIBED . . .

Rx *viae durae atque bonae sine fine*



Rx *viae durae atque bonae sine fine*

Rx *viae durae atque bonae sine fine*

Rx *viae durae atque bonae sine fine*

Rx *viae durae atque bonae sine fine*

THE SOCIAL AND RELIGIOUS LIFE OF THOUSANDS AND THOUSANDS OF FAMILIES IS STIFLED BY SECONDARY ROADS THAT ARE IMPASSABLE MUCH OF THE TIME.

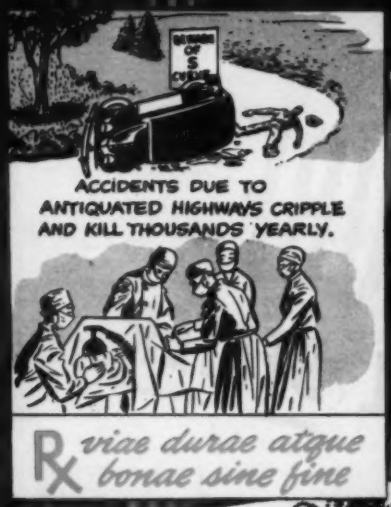
Rx *viae durae atque bonae sine fine*

Rx *viae durae atque bonae sine fine*

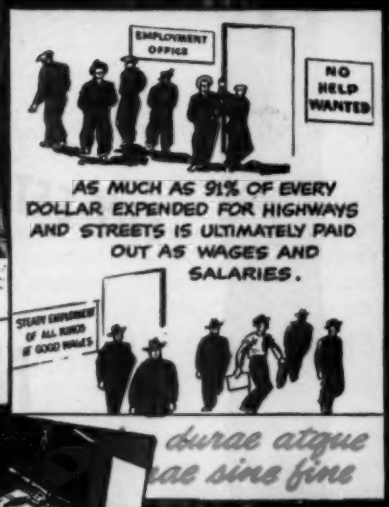
UNION

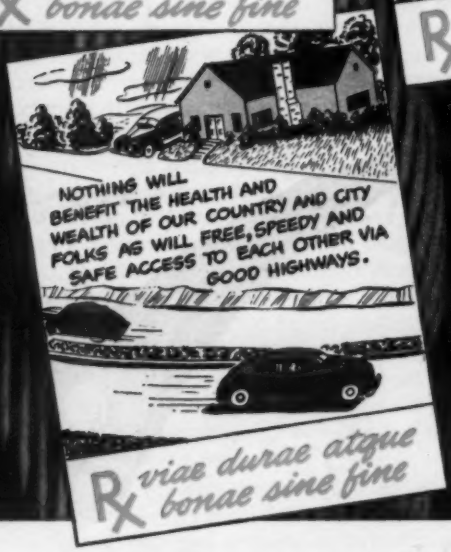
union *Wire Rope*

union-formed IS *Preformed* TO OUTPERFORM

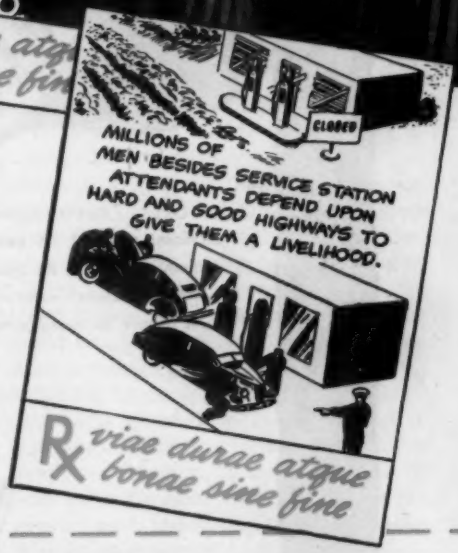


LOW, NARROW AND LIGHT BRIDGES CONSTITUTE UNSAFE, OFTEN UNUSABLE LINKS IN OTHERWISE ADEQUATE ROADS.
Rx viae durae atque bonae sine fine


EMPLOYMENT OFFICE
NO HELP WANTED
AS MUCH AS 91% OF EVERY DOLLAR EXPENDED FOR HIGHWAYS AND STREETS IS ULTIMATELY PAID OUT AS WAGES AND SALARIES.
durae atque
sine fine


NOTHING WILL BENEFIT THE HEALTH AND WEALTH OF OUR COUNTRY AND CITY FOLKS AS WILL FREE, SPEEDY AND SAFE ACCESS TO EACH OTHER VIA GOOD HIGHWAYS.
Rx viae durae atque bonae sine fine

PROMPT AUTO REPAIRS
FEW CARS AND TRUCKS SERVE THE FULL LIVES OF WHICH THEY WILL BE CAPABLE WHEN ALL ROADS ARE HARD AND GOOD.
Rx viae durae atque bonae sine fine


CLOSED
MILLIONS OF MEN BESIDES SERVICE STATION ATTENDANTS DEPEND UPON HARD AND GOOD HIGHWAYS TO GIVE THEM A LIVELIHOOD.
Rx viae durae atque bonae sine fine

THE DOCTOR HAS PRESCRIBED...

✳HARD AND GOOD ROADS WITHOUT END

Not only has the doctor written this prescription—he has earmarked funds to pay half the cost of a 3 year course of medicine.

The other half (1½ billion dollars) must be raised by 48 patients. The will to get well of a majority of them is at a low ebb. Only 7 states have sufficient plans for the first year of the program. Plans for highway projects ready to let amount to less than half the medicine apportioned by the doctor for the first year to say nothing of the other 2½ years.

A lot of nursing is yet necessary. If a large highway construction program is to be gotten under way in 1946, then everyone in the industry and profession must turn nurse and help the doctor coax the patients to take their medicine. Otherwise, men will go unemployed, traffic will snarl and the next dose of medicine will be plenty bitter for lovers of the American way of life to take.

UNION WIRE ROPE CORPORATION, 2156 Manchester Ave., Kansas City 3, Mo.

☐ Send a Free copy of book entitled "The Road Ahead"
☐ Send a Free copy of book entitled "Put Your Town on the Air Map"

Name.....

Firm .....

Address..... *City*..... *Zone*... *State*.....

E-48

LAY·SET'S GREEN·LUBE MAKES IT STILL BETTER

• *GREEN-LUBE is a superior grade lubricant made to our own specifications. It clings to the wires longer—protects them better—enables them to give increased service.*

HAZARD'S All-Green rope is **LAY•SET** Preformed made of Improved Plow Steel—the best rope. Now this rope is still better, because it is completely protected with GREEN-LUBE. Every strand is pressure-packed with our new superior green lubricant which gives added life to every wire. Not a single strand, not two strands, but every strand—yes, even every individual wire is completely covered by GREEN-LUBE. The all-green color is an added protection to the highest grade rope made: **LAY•SET** Preformed I. P. S. Use only Hazard's All-Green rope.

ACCO

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma, Bridgeport, Conn.

HAZARD WIRE ROPE DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety

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ROCK PRODUCTS

What's Wrong with Reconversion?

FAILURE of those in authority to lick current problems, apparently in favor of worrying over long range possibilities of mass employment in years to come, definitely is retarding reconversion at a time when the nation can ill afford not to have jobs ready for millions.

The wave of strikes sweeping the country and the continuance of government edicts like price controls as they apply to certain industries, plus all the agitation for full employment, guaranteed annual wages and the like cannot help but engender uncertainty and even fear for the future in the minds of all classes which make up our national economy.

If reconversion is delayed too long a time, the fear of depressed business conditions easily could arise, and fear of uncertain livelihood, or profits, has a tendency to lead to depressed conditions. When business, agriculture and labor are afraid for the future it is only natural for all classes to adjust themselves for that eventuality. Then there would be no expansion of industry and unemployment logically would result.

That could happen, given time, but is most unlikely, for the conditions responsible for our present dilemma either will adjust themselves or be adjusted. But time is fast running out on us.

Strikes on the present scale cannot go on indefinitely. They usually are comparatively short-lived, for labor needs industry just as much as industry requires men. Certainly, it appears that some compromise wage adjustments will have to result but that can be effected by some elasticity in government regulations, permitting industry more of a margin on which to operate. The elimination of price controls, at least in certain industries, or judicious application of such controls, is absolutely essential if there is to be any hope of *arbitrarily* raising wages. That is what labor is demanding —more money for the same or less productivity.

Those who profess to know, say the first and fundamental requirement for speedy reconversion is the restoration of free markets and the complete removal of price control even in the face of inflationary potentials. If price control is properly applied while demand far outstrips supply of goods, it can assist reconversion and benefit consumers and business alike.

Advocates of unbridled free competitive ways of doing business who insist that business and industry be given a free hand in arriving at needed readjustments have a solid foundation for their arguments, certainly *if* we consider reconversion our number one national problem. The competitive urge will determine the speed and the extent of reconversion. As price controls exist now, they constitute one of the factors that breed uncertainty. Certainly they comprise an unpredictable element, for no one can forecast the whims of the control agency.

If such controls are retained they cannot be applied generally, but must be selective and applied only where needed to maintain stability until new production has made headway. In a healthy economy, high prices will add to profits and accentuate the speed of reconversion and the scale of production.

In the rock products industries, which are purely local in character, prices have never been unduly inflated due to competitive conditions. With removal of price controls, some price increases would follow in anticipation of higher costs but price increases would be difficult to sustain with increased competition when volume of business rises. That was proved in the 1920's.

Labor's Attitude

Insofar as labor's demands for higher wages are concerned, the age-old law of supply and demand is being applied to the discomfiture of the employer. Many workers are *temporarily* removed from the labor pool, largely because they think they were abused by having had to work long hours throughout the war and are entitled to a "vacation." Some are cashing in war bonds as well as receiving unemployment compensation. The payment of such compensation should not be allowed where good jobs are available, and should be restricted to relief cases only.

While many workers have been misinformed to believe that their work made the owner of a business a capitalist, top union leaders themselves know better and have so expressed themselves. The very fact that they have gone all out for collective bargaining between labor and management is, in itself, proof that they desire free enterprise of the sort which is demonstrated by competition. They have publicly recognized that the way to get higher wages is to produce more goods, which is significant when we consider the fate of free enterprise in other countries over the world.

Collective bargaining as an instrument in management-labor relations is doomed to failure unless it can be made a mutual thing. Otherwise it becomes a monopoly; a restrictive measure. If we must have it, management must have the same right to provide for management security as a union has for union security. In fact, it is management's duty to make such demands on unions that are necessary to preserve the employer's ability to perform—which, after all, is to the mutual advantage of both parties.

Bror Nordberg

CURTISS-WRIGHT CORPORATION
AIRPLANE DIVISION-BUFFALO PLANTS
BUFFALO, N.Y.
September 12, 1945
Buell Engineering Co., Inc.
70 Pine Street
New York 5, New York
Gentlemen:
It is a pleasure to answer the recent inquiry from your Engineering Department checking upon the mechanical operation of the Buell Dust Recovery Systems installed in our three plants.
Buell Fly Ash Collectors have been in service on twelve (12) boilers since 1941, operating continuously.
Since the time of their installation, they have cost us nothing for maintenance or repair. Their collection efficiency has fully met our requirements, and they have accomplished in a highly satisfactory manner the job for which they were installed.
Yours very truly
Guy Maher
Guy Maher, Plant Engineer
CURTISS-WRIGHT CORPORATION
Plant #2
Curtiss Commando

• **BUELL DUST RECOVERY SYSTEMS** are used throughout industry in the collection or reclamation of many kinds of dust, in numerous production and process operations. Hundreds of satisfied industrial users will attest to Buell's—"High Efficiency, Low Maintenance, Long Life."

*Write for Buell's new, revised book "**The Buell** (van Tongeren) **System of Industrial Dust Recovery**"... now in its fourth printing.*

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DUST RECOVERY SYSTEMS

BUELL ENGINEERING COMPANY, INC.
Suite 5000, 2 Cedar Street, New York 5, N. Y.
Sales Representatives in Principal Cities

DESIGNED TO DO A JOB, NOT JUST TO MEET A "SPEC"

★ ★ ★ Washington NEWS

On November 2, the War Production Board authority expired. Its successor, the Civil Production Administration, has greatly limited powers designed to bridge the reconversion period during which certain materials may be in short supply. Under CPA the rock products industry may apply for the non-extendible CC rating in certain limited cases where supplies and equipment are required for important civilian needs. The conditions are set forth in paragraph (d) (1) of PR-28. Applications should be made on WPB-541A to the nearest CPA office; for less than $5000, the applications are processed in the field, over $5000 will be sent to Washington. The AAA rating will be issued in emergency conditions as in the past, but the applicant must have either suffered a breakdown of operations or show the imminence of a breakdown. With the expiration of CMP Reg. 5, the industry is now subject to the limited inventory restrictions of PR-32.

Labor Board Closing Cases

Since October 22, the National War Labor Board has ceased to issue directive orders, but continues to make "recommendations." No appeals from these recommendations are permitted, but appeals from directive orders already issued will be processed as heretofore. No new dispute cases have been accepted since V-J Day. It is expected that WLB will wind up its affairs before January 1, but the strike problem is looming more formidable than ever. Some believe that the Labor-Management Conference called by President Truman may recommend another Labor Board having some of the functions of the war-time Board.

Highway Program Given Green Light

With the adoption by the House and Senate of H.C.R. 81, the provisions of the Federal-aid Highway Act of 1944 are now in effect. The program provides for an expenditure of $500,000,000 yearly for the next three years to be matched by equal State expenditures. The federal contribution is divided as follows: $225,000,000 for primary highways; $150,000,000 for secondary roads; $125,000,000 for urban highways.

No Price Control for Rip-Rap

On October 12, Administrative Director J. R. Boyd of the National Crushed Stone Association received a letter from W. S. Ingram, Price Executive, Building Materials Price Branch, OPA, in reply to his inquiry concerning the interpretation to be placed on Supplementary Order No. 129. This order suspended price control "on sales and deliveries of architectural dimension stone, monuments and memorials, and embraces all types of natural stone that is quarried, cut, and shaped to specified dimension, or patterns, and is used principally in the construction of masonry walls and for memorials." In his reply, Mr. Ingram said, "Since rip-rap is a type of stone which is quarried and primarily shaped for use in breaker or retainer walls, it is the opinion of this Office that rip-rap is included in the commodities listed in Supplementary Order No. 129, and is suspended from price control."

Regional Price Adjustments

Producers of sand, gravel, crushed stone, brick, gypsum and gypsum products and other allied construction materials and refractories with gross annual sales of $1,000,000 or less may make applications for adjustments in ceiling prices to regional offices of the OPA, effective November 5, as Amendment No. 1 to MPR No. 592. Previously manufacturers with gross annual sales of $200,000 or over were required to apply to the OPA national office in Washington for price adjustments. Under new liberalized provisions, producers may apply to OPA for price adjustments when their over-all operations have been conducted at a loss, regardless of whether their production is essential or low-priced.

Wage-Price Policy

Since V-J Day, no pronouncement has caused so much interest as President Truman's speech on October 30, outlining the administrations wage-price policy. The new Executive Order defines three situations in which wages may be increased regardless of their effect upon prices:

"a. Increases where the percentage increase in average straight time hourly earnings in the appropriate unit since January 1941 has not equalled the percentage increase in the cost of living between January 1941 and September 1945.

"b. Increases necessary to correct inequities in wage rates or salaries among plants in the same industry or locality, with due regard to normal competitive relationships.

"c. Increases necessary to insure full production in an industry, designated by the Stabilization Administrator, which is essential to reconversion and in which existing wage rates or salaries are inadequate to the recruitment of needed manpower."

This order does not offer much hope for price relief, and the aggregates industries already are feeling the "squeeze" between mounting labor costs and fixed prices for the products. In certain areas, as for example Michigan, the sand and gravel companies have been faced with strike threats but have been unable to meet the increased costs without OPA approval for price increases of their products. Producers in this State have announced that they will have to shut down if no relief is obtained.

Cement Price Increase

OPA has announced, effective November 10, an increase of 10c a barrel in producers' ceiling prices for Portland cement in Georgia, Alabama, Tennessee, Louisiana, Mississippi, North Carolina, South Carolina, Florida and most of Virginia. The higher price may be passed on to buyers by all resellers. Ceiling prices for Portland cement in these states in sales by dealers to consumers currently are between $2.75 and $3 per bbl.

Building Material Shortages

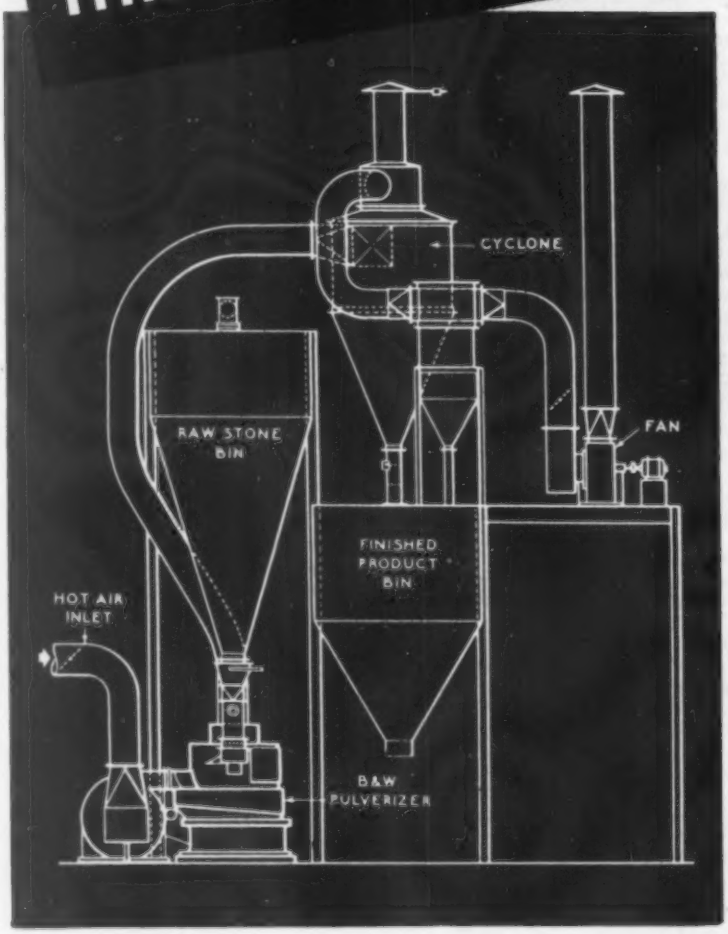
In an address before the Building Products Executives Conference on November 2, Administrator John D. Small of the Civilian Production Administration, successor to WPB, pointed out that although construction order L-41 had been relaxed very considerably by successive amendments, all was not smooth sailing and certain key materials continue in short supply. He mentioned particularly lumber, brick, structural tile, and plumbing and heating equipment. He did not mention concrete block, but in many areas there is a definite shortage of this material but it is not as acute as for clay products. Wages and pricing, he reported, are the principal obstacles to increasing production of scarce building materials, but they are not within the jurisdiction of CPA.

Gypsum Situation

Referring to gypsum, Administrator Small said, "Shortages of gypsum lath, unlike those of the other materials I have described, are not due principally to man power problems.

(Continued on page 56)

BLUEPRINT for economical limestone grinding



Substantial savings in power and maintenance can be effected in the grinding of limestone by the use of Babcock & Wilcox Pulverizers.

Material handled flows through the mill in a thin, evenly distributed layer. Fines are discharged quickly, and are prevented from accumulating and interfering with the pulverizing operation. Each ball, co-acting with the grinding ring, works effectively over its entire travel, with the grinding pressure applied directly to the material—and to the minimum amount of material at a time. Result is efficient operation at low cost for power.

The large output of the B&W Pulverizer is due to the speed with which material passes through the mill, the plurality of grinding zones, and its positive grinding action. Provision can be made for drying within the system, if desired.

B&W System for Grinding Limestone

BABCOCK & WILCOX

85 LIBERTY STREET NEW YORK 6, N. Y.

C-60

Confusion Compounded

FEDERAL GOVERNMENT rules and regulations, under which business and industry are supposed to be conducted, are changing so rapidly, either actual change of rule, or change of interpretation of a previous rule, that it takes a clever and intelligent trade association executive all his time to keep abreast. The poor lone business executive, who attempts to keep up by reading, and by his own interpretation of what goes on, is certainly handicapped and probably is a consistent if innocent violator of one or more regulations.

A participator in a recent conference wanted to know if those present had heard of a new club that is rapidly gaining converts among business men. It is known as the C.A.I.C. Liberally translated and to avoid the use of profanity this stands for: "Christmas, Am I Confused." The hearty laugh that greeted this sally showed not only that all felt themselves in the same boat, but that in spite of their predicament, American businessmen preserve a sense of humor, and hence their equilibrium.

Problem Needs Simplification

Our country suffers from the failure of some one high in government authority to explain the fundamentals of the economic problem as a whole. The constant boast is that this is the richest and most prosperous country in the world. In the sense that we have the know-how and presumably the enterprise to supply our wants and necessities for comfortable living, this is true. Also, we have a national debt about equal to the sum total of the national debts of all our late allies. That debt represents irreplaceable materials from our oil wells, mines, farms and factories and irrecoverable labor expended for things that have been destroyed.

People *were* kept busy producing and using instruments of war because the purchaser, the Federal Government, wanted them in quantity at any price. In payment the Government gave the producers—employers and employes alike—pieces of paper which are merely I.O.U.'s. This paper in the form of currency and bonds has no intrinsic value; it is redeemable only in new paper. These I.O.U.'s in the hands of the public—employers, financiers and working men, alike—have value to their owners only as a medium of exchange for material things needed by industry and individuals in carrying on.

People *will be* kept busy producing and using instruments for peaceful living only if volunteer purchasers can be found for products in commerce and industry. We no longer have a single purchaser of the products of labor, with credit unlimited. Instead, we have a host of individual purchasers whose credit, though large, measured by the present value of their I.O.U. holdings, is not unlimited, and whose purchases are governed not by critical necessity but by a delicate balance between the relative economy of waiting for possibly lower prices and making present things serve, or making unexpectedly larger investments in something new.

The Government's implied promise to holders of its I.O.U.'s is to put real tangible value into something that now has no intrinsic value. That can be done only by encouraging people to produce things of tangible value in exchange for a tremendous volume of I.O.U.'s. To make them of value to their holders we must replace all the real wealth destroyed in the conduct of the war with new real wealth to be used in peaceful pursuits.

Responsible government officials have said that it would do no good to put a ceiling on wages, because the government could not compel anyone to work for the ceiling wage. By this argument the stage is being set to release wage increases more or less indiscriminately. By the same reasoning, which should be used in the same argument, it is useless to have ceiling prices on commodities, because the government can not compel producers to produce at those ceiling prices. The situation is leading, naturally, to a stalemate, where people will find that their Government I.O.U.'s will buy few things that they want, or place them at such high prices that people no longer feel the immediate necessity of purchasing. And we don't refer here merely to automobiles, radios, washing machines, etc.; we refer also to houses, highways, industrial machinery, etc.

The situation in a great many ways is very similar to 1919-20-21. Organized labor was relatively as strong then as it is now. It was especially favored by the Wilson administration as it is by the present one. It was difficult for industry to "come back to earth"—to produce for discriminating buyers instead of for a single non-discriminating one. Organized labor made an unwise effort to prolong the "silk-shirt" era. And even public highway officials were reluctant to buy at prices that resulted from the uncertain and confused conditions. Recovery was delayed at least three years. When it came, it had so much impetus that labor soon gained all it had held out for, and with little effort; but the delayed impetus, or momentum, carried us into the big bubble burst of 1929.

The idea that wages can be increased and prices held firm is of course ridiculous; and probably no man intelligent enough to hold an important position in Government really believes in it. There is very little in the world that has actual value until labor has been expended on it. The explanation that because labor constitutes, let us say, one-third of the cost of an automobile, that wages can be increased 15 percent but the cost of the car only 5 percent, is fallacious. If the wages of automobile workers are increased 15 percent, the wages of iron miners, coal miners, steel mill workers, etc., will eventually be increased 15 percent, or more; and all the costs of an automobile will be increased 15 percent or more.

Then all will be back where we started and we will be ready for another spiral upward. Of course, sometime something has to break; some weak link in our economy breaks; and even the government can not then prevent a repetition of what happened in 1929. Such a break in our economy probably may be prevented now; but not by any action the people of this country have taken to date. We say the people, because the people of this country (public opinion) are the government. They are above the politicians. The "government"—the institution itself—as distinct from the people, would profit from inflation, as any debtor does, particularly one that can pay off in paper of his own printing. Only the people can demand and put real value into the papers in their hands.

Nathan C. Rockwood

ATLAS DURAPLASTIC

Air-Entraining Portland Cement

In CONCRETE BLOCK

BLOCK Manufacturers who have investigated and used ATLAS DURAPLASTIC have found—

★ **It improves appearance;** reduces breakage; lowers water absorption; generally increases compressive strength.

★ **It calls for no additional expense** or unusual changes in manufacturing procedure.

★ **It shows greater resistance** to the passage of water.

Atlas Duraplastic cement complies with ASTM specifications and sells at same price as regular cement. It feeds better through the machine; gives green product a rubbery consistency that resists cracking and tearing in handling; makes denser, more compact, better-looking block.

Send for further information. Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

OFFICES AT: New York, Chicago, Pittsburgh, Cleveland, Philadelphia, Albany, Boston, Des Moines, Minneapolis, Duluth, Waco, St. Louis, Kansas City, Birmingham.

ATLAS DURAPLASTIC (TRADE MARK REG. U.A.C. CO.)

AIR-ENTRAINING PORTLAND CEMENT

For Concrete Products

BP-D-39

SUNDAY EVENINGS—ABC (Blue) Network—U. S. Steel's *The Theatre Guild on the Air.*

the *Personal Side* of the NEWS

Marquette Appointments

JACK K. WHITE, who recently returned from 32 months of infantry combat service in the Mediterranean Theater of Operations, has been

Jack K. White

named director of public relations of the Marquette Cement Manufacturing Co., Chicago, Ill. Prior to his Army service as captain with the 34th Infantry Division, Mr. White had been employed in the editorial departments of the New York Times, The New Yorker magazine and Esquire publications; also as a writer for the radio and editor of a real estate trade journal in Chicago. CARL FOX, formerly city engineer for Decatur, Ill., has been appointed chief

Carl Fox

service engineer for the central Illinois and Indiana area. Erling A. Michaelson, former personnel director for Bendix Aviation Corp., Illinois Division, has been made assistant industrial relations manager.

Returns to Mexico

A. B. STEWART, for many years general manager of the Tolteca and Mixcoac cement companies in Mexico, and during the past four years works manager of the British Columbia Cement Co., Ltd., at Bamberton, Tod Inlet, British Columbia, Canada, is returning to Mexico and will be the manager of the newly inaugurated company, Cementos Veracruz, S. A., and will reside with his family at Orizaba, Veracruz. V. E. METCALFE who officiated as manager of the Veracruz company during its period of construction will return to Puebla and assume his initial position as assistant general manager of Cementos Atoyac, S. A., which is the parent company of Cementos Veracruz, S. A., and Plastocement, S. A. ALTON J. BLANK heads the three companies as general manager. JULES LACAUD, president of the three companies, has announced that Cementos Atoyac, S. A., will soon terminate its construction work which involved increasing substantially its cement producing capacity as well as modernization program.

Retires

EMUND C. POWERS, manager of lime sales for the Marble Cliff Quarries Co., Columbus, Ohio, has retired after nearly 30 years of service with the company. He has been succeeded by Charles E. Rarey. Mr. Powers joined the company in 1916 and was in charge of the burned lime manufacturing plant when it was erected in 1923. He is known in the burned lime industry from coast to coast, and is a member of the board of directors of the National Lime Association.

Named State Geologist

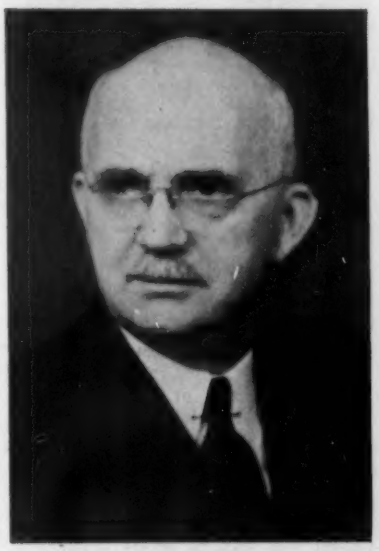
H. B. BURWELL, an associate geologist in the State Division of Geology, Nashville, Tenn., has been appointed state geologist to succeed Walter F. Pond, who held the office for 18 years. Mr. Burwell was with the division in 1938 and rejoined a year ago.

Chief Engineer

R. S. WEAVER, mine superintendent of the Gypsum, Ohio, plant of the U. S. Gypsum Co., Chicago, Ill., has resigned to become chief engineer of the United Clay Mines Corp., Trenton, N. J.

Ash Grove Promotions

A. K. FROLICH, chief engineer of all plants of the Ash Grove Lime and Portland Cement Co., Kansas City, Mo., and superintendent of the Louis-



A. K. Frolich

ville, Nebr., plant, has been transferred to the Kansas City office. He will continue as chief engineer of all plants but will relinquish the position of superintendent of the Louisville plant. Born in Kristiansand, Norway, in 1887, Mr. Frolich came to the United States in 1924. In that year, he was employed as a draftsman by the Ash Grove Lime and Portland Cement Co. at Chanute, Kansas. In 1927, Mr. Frolich was transferred to Louisville, Nebr., to take charge of

A. Lundteigen, Jr.

K. W. Wright

the construction of the new plant there. Upon completion of the plant, Mr. Frolich was made superintendent, and served in that capacity until his recent promotion October 1 of this year to chief engineer for all the company's plants. His technical education was secured in Germany and he was employed as an engineer in Norway and Russia.

A. LUNDTEIGEN, JR., who was assistant superintendent under Mr. Frolich and chemical engineer of the Louisville plant, has been promoted to chemical engineer of all plants and superintendent of the Louisville plant. Mr. Lundteigen received his degree of B.S. in mechanical engineering from the University of Michigan. During vacations he worked at various jobs in the Chanute, Kans., and Galloway, Mo., plants. Following graduation he was employed as a draftsman during construction of the Louisville, Nebr., plant and when operations began there, he was appointed assistant superintendent under Mr. Frolich.

Ira E. Barber

K. W. WRIGHT, assistant superintendent of the Chanute, Kans., plant, has been promoted to the position of superintendent of that plant. Mr. Wright has been with the company since 1917. His first work was in the engineering department, and later he was promoted to the position of assistant superintendent of the plant. He held this position until the death of Guy O. Gardner, when he was appointed superintendent.

P. L. WRIGHT, shop foreman at the Louisville plant, has been appointed assistant superintendent of that plant. Mr. Wright became associated with the company in 1927, working as an assistant in the engineering department. In 1929 he was made shop foreman, which position he held until his recent promotion. He secured his education in the Fort Scott, Kans., public schools and in the Industrial Engineering School of the Kansas University, Lawrence, Kansas.

IRA E. BARBER, chief draftsman at the Chanute plant, has been made assistant superintendent. Mr. Barber also started in the engineering department of the company shortly after his graduation from the Engineering School of the Kansas University.

Universal Auditor

BARGE MCCALL, senior clerk at the Leeds, Ala., plant of the Universal Atlas Cement Co., New York, N. Y., has been made local auditor of the Independence, Kans., plant. Mr. McCall, who has been with the company for 24 years, succeeds Wade W. Postelle, who returns to his former post as local auditor at Leeds. Mr. Postelle has filled the position of local auditor at Independence since March, 1945.

Sales Representative

DAVID WRIGHT, formerly associated with the Chicago office of the Portland Cement Association and more recently in the district office at Washington, D. C., has been appointed sales representative of the Besser Manufacturing Co., with headquarters at Phoenix, Ariz.

Lord Mayor of London

COL. A. C. DAVIS, father of Lt. Gilbert Davis, R.N.V.R., who visited ROCK PRODUCTS recently on several occasions, has been elected lord mayor of London. Col. Davis has been managing director of the Associated Portland Cement Manufacturers in England.

Lehigh Changes

J. J. BASSETT, superintendent of the Oglesby, Ill., plant of Lehigh Portland Cement Co., Allentown, Penn., has retired after 27 years of service with the company. Mr. Bassett started with the company in 1918 as an engineer and was made superintendent of the plant in 1937. P. A. GROLL, who has been assistant superintendent and supervising chemist at Oglesby, will succeed Mr. Bassett as superintendent. Mr. Groll, a graduate chemical engineer, has been with the company since 1925.

J. J. Bassett

Board Chairman

HENRY CROWN was elected chairman of the board of directors of Material Service Corp., Chicago, Ill., upon his return from active service with the U. S. Army Corps of Engineers. Mr. Crown has been associated with the firm since its establishment in 1919. He resigned as chairman of the board upon entering the service

Henry Crown

in 1942, but continued his board membership. STUART COLNON, a member of the board of directors for the past five years, and former lieutenant colonel in the army engineers, has been elected vice-president of the company. Mr. Colnon, who was commissioned as a captain in 1942, served in the South Pacific theater for the

Stuart Colnon

past two years. He has also resumed his positions of vice-president and director of the John E. Colnon Co., Inc.

Retires

MORGAN Ross has retired as active head of the Ross Sand and Gravel Co., Concordia, Kans., and his interest in the firm has been purchased by his son, Ellis Ross, who is now sole owner of the business. Mr. Morgan Ross first started in the sand and gravel business at Clyde and Clifton, Kans., in 1930. Two years later he took over the old county sand pumping equipment in Concordia. He enlarged the plant and installed new and modern equipment. The present owner, Ellis Ross, who gave up a responsible position in the United States Area Engineers office in Kansas City in 1943, is planning further improvements in the plant.

Veteran Joins Wolverine

W. B. ANGLEMYER, recently discharged veteran, has joined the sales staff of the Wolverine Portland Cement Co., Kalamazoo, Mich. He will serve the northern Indiana territory, replacing R. I. Brady who is now operating the R. I. Brady Construction Co., Chicago, Ill. Mr. Anglemyer is the second World War II veteran to join the Wolverine sales force, the first having been F. C. Pollycutt who is now covering the company's Michigan territory.

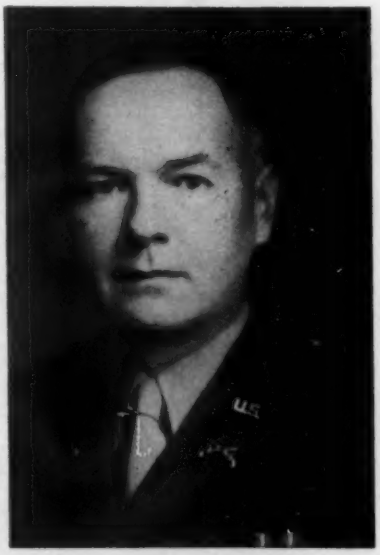
Mr. Anglemyer was a sergeant of the 1776th Engineers attached to Gen. Omar Bradley's headquarters. Before going to England, he was construction foreman on the Alcan Highway for 18 months. While in England, he worked on construction of a 500,000 gal. concrete water tank at Braunton. He hit the Normandy beachhead with his company in the first hour of the invasion and after the Allies were established on French soil assisted in the construction of the largest railroad bridge built by the U. S. Army Engineers in Europe.

In England Mr. Anglemyer married an English girl and she and their child are still abroad, waiting for transportation arrangements to be completed. They will make their home in Bristol, Ind., his home town and his future business headquarters.

N.C.S.A. Engineer

JOSEPH E. GRAY has been appointed field engineer of the National Crushed Stone Association, replacing E. W. Bauman who has resigned to return to his former employer, the Republic Steel Co., highway sales department. Mr. Gray will serve under the direction of A. T. Goldbeck, director of engineering. He has been connected with the Association since the formation of its research laboratories in 1928, serving as testing engineer in charge of investigations on the various uses of crushed stone. He received his degrees of B.S. in civil engineering and C.E. from George Washington University. Prior to joining the Association Mr. Gray had worked at the National Bureau of Standards and the Bureau of Public Roads. He is a member of the A.S. T.M., serving on Committee C-9 on concrete and concrete aggregates. He and Mr. Goldbeck are co-authors of several technical papers, one of which is on the proportioning of concrete.

Joseph E. Gray



Col. G. K. Engelhart

In Charge of Sales

COLONEL GEORGE KEMP ENGELHART, who was assistant to the president of the Fuller Company, Catasauqua, Penn., before being ordered to active duty as a reserve officer shortly after the United States entered the war, has been appointed vice-president in charge of sales. Mr. Engelhart has been connected with the company since 1923, starting as patent lawyer and later being placed in charge of research and development. In 1939 he was made assistant to the president. While in service, Col. Engelhart was appointed Director of the Internal Security Division, Provost Marshall General's Office. Following the surrender of Germany, he was appointed Special Assistant to the Provost Marshall General. He was awarded the Legion of Merit, the Security Shield of Honor, and a citation by the Commandant of the United States Coast Guard, for important contributions to the Port Security Program.

Visitor from Hawaii

WILLIAM A. MORGAN, chief engineer of Hawaiian Gas Products, Ltd., Honolulu, Hawaii, was a recent visitor to Chicago and the offices of ROCK PRODUCTS. His visit to the United States is for the purpose of inspecting lime plants and concrete plants and to contact American manufacturers of machinery. Mr. Morgan made ROCK PRODUCTS his headquarters during his stay in Chicago.

Silica Director

JOSEPH G. BUTLER III has been named a director of the Industrial Silica Corp., Youngstown, Ohio, to succeed Judge John W. Ford who resigned.

FEWER APPLICATIONS NEEDED—

because protection lasts longer when you use the famous chassis lubricant that . . .

★ Resists squeeze-out
★ Seals out dirt and moisture
★ Stays in bearings under all temperatures

TRACTORS, graders, shovels, trucks and other construction equipment last longer, maintenance costs go down, when you lubricate them with long-lasting *Texaco Marfak.*

Marfak is one of the most famous of all Texaco lubricants. It is far more than a mere "grease". This unique product, designed especially for chassis lubrication, is both tough and adhesive. It cushions parts against road shock and clings tenaciously to bearing surfaces despite high speeds, heavy loads and extremes of temperature.

In addition, *Texaco Marfak* has the extraordinary characteristic of forming a fluid film inside a bearing while retaining its original consistency at the outer edges—thus sealing itself in, sealing out dirt and moisture. Its high resistance to squeeze-out means greater protection with fewer applications.

For wheel bearings, the right lubricant to use is *Texaco Marfak Heavy Duty.* It stays *in* the bearings, assuring safer braking. No seasonal change is required.

Texaco Lubrication Engineering Service is available through more than 2300 Texaco distributing plants in the 48 States. Get in touch with the nearest one, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Lubricants and Fuels

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON EVERY SUNDAY NIGHT—CBS

NEWS OF THE INDUSTRY

Lehigh May Build Minnesota Plant

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., has plans for the erection of a $3,000,000 portland cement plant at Monticello, Minn. Marl deposits in four lakes in Wright and Stearns counties will provide raw material. Recently the company was granted a 25-year permit by the State Executive Council to excavate the marl from the lakes. The company has purchased 1500 acres for the plant and raw material source of supply. Plant production, according to the local report, will be 500,000 bbl. annually.

Gypsum for Agriculture

ARIZONA GYPSUM CORPORATION, Phoenix, Ariz., has started operations at a new plant in Phoenix. Gypsum rock is obtained from a mine at Winkelman. At present a considerable part of the production is ground for use as a fertilizer. D. W. Fisher, head of the Fisher Contracting Co., and present head of the Arizona chapter, General Contractors of America, is president; C. H. McDonald, materials engineer, U. S. Bureau of Public Roads, is vice-president; and Earl Stark, formerly assistant agricultural chemist for the University of Arizona, is plant manager and chemist.

Purchase Cement Co.

AMERICAN SILICA SAND CO., Ottawa, Ill., has purchased the property of the Utica Hydraulic Cement Co., Utica, Ill., according to President Chas. J. Niesen of the silica concern. A stone crushing plant is being installed on the Utica Hydraulic Cement property to produce agricultural limestone, and various gradations of road stone and concrete aggregates. In addition, the cement plant is being modernized to produce various types of natural cements. Recently this plant has been utilized to bag superphosphate for the government.

Start Ready Mix Plant

CEMENT-MIX CONCRETE CO., Erie, Penn., has started up operations, according to an announcement by J. S. St. John, president. Equipment includes two complete batching plants, one an Erie Steel Construction Co., unit of 150-cu. yd. capacity with a 600-bbl. bulk cement bin, and the other a C. S. Johnson with 110-cu. yd. capacity with a 600-bbl. bulk cement bin. Transit mixers include: five 3-cu. yd. Jaeger mixers mounted on Macks; three 2½-cu. yd. mixers on Internationals; and one 1½-cu. yd. mixer mounted on a Mack. E. J. Berry is manager.

Mineral Industries

INDUSTRIAL MINERALS producers of Oklahoma met in Ada, Okla., on November 29, 30, and December 1 to attend the sixth annual Oklahoma Mineral Industries Conference.

Speakers included Hugh D. Miser, geologist in charge, Section of Fuels, U. S. Geological Survey, Washington, D. C.; Geo. W. Ward, chairman Inorganic Chemistry Research, Midwest Research Institute, Kansas City, Mo., who discussed mineral resources; Clarence F. Byrnes, editor, Times Record, Fort Smith, Ark.; and H. L. Winburn, president, Niloak Potteries.

Crushed Stone Plant Fire

E. C. SCHROEDER CO., McGregor, Iowa, reported that a fire at its Wyalusing, Wis., quarry caused damage estimated at $30,000. A gas truck caught fire and the flames rapidly spread to nearby machine shops, tool rooms and garage.

War Profits in Cement?

MARQUETTE CEMENT MANUFACTURING CO., Chicago, Ill., recently placed before the public in thirteen newspapers throughout the territory served by its plants an advertisement which was designed to dispel the belief current among many people that the cement industry made enormous profits out of war construction business.

As shown in the illustration, the advertisement is entitled, "Those HUGE War Profits" and the copy is very cleverly written as a letter signed by President W. A. Wecker. It is illustrated with easily followed charts and cartoons. One of the paragraphs in the advertisement outlines the financial status of the company during the years from 1940 to 1944 which incidentally also is largely the picture for the industry as a whole. It is quoted as follows: "In the cement industry, we had only one large volume year during the wartime. That was 1942, when war building was going at a terrific pace. After that profits declined materially from normal years and in 1943 and 1944 were well below our average. In the case of our own company, Marquette, the decline was extremely severe.

Those HUGE War Profits
It Wasn't Cement . . .
The Plants Kept Going!
Did the Workingmen Profit?
Marquette Cement Manufacturing Company

Advertising placed in thirteen midwestern newspapers gives the true picture of cement company profits during the war years

Improve Utah Cement Plant

IDEAL CEMENT CO., Denver, Colo., has announced the construction of additional storage and shipping facilities at its Devil's Slide, Utah, plant. The cost of this program with machinery will be about $300,000. In addition to the improved storage and packing facilities, a complete rehabilitation of the entire plant is planned as rapidly as conditions will permit.

Open New Quarry

BEU & SONS CO., Summer, Iowa, has opened up a new quarry near Marshalltown, Iowa, on property leased from Ada Conrad. About 800 to 900 tons of agricultural limestone per day will be produced at this plant. According to a local report, this is a temporary operation involving the production of about 20,000 tons of material. The Diesel-electric powered plant will then be moved to Gifford, Iowa.

Buy Block Concern

LOUISIANA CONCRETE PRODUCTS, INC., on Choctaw Road, Baton Rouge, La., has been acquired by A. E. Lloyd and G. C. McCullough, Birmingham, Ala. Plans have been made to enlarge capacity four times the present output. Machinery also will be installed to manufacture precast concrete joists and roof tile.

Install Secondary Crusher

KILCORN QUARRIES, Bedford, Penn., producers of roadstone, has placed in operation a 3-ft. Symons cone for secondary crushing.

Washington News

(Continued from page 47)

Gypsum lath is a small profit item and its production automatically cuts down the production of gypsum board, a large profit item. In prewar years the proportion of production was about 70 percent lath and 30 percent board. Today, it is about 25 percent lath and 75 percent board. Production probably ought to be about 50-50.

The principal limiting factor in the production of both lath and board is the supply of gypsum paper liner. This paper is in short supply and is also needed by the paper box industry. Here again, pricing enters the picture. Gypsum lath producers, with the exception of one large firm, responsible for production of about 53 per cent of all lath, report that they could not use additional supplies of gypsum liner for lath, unless some price increases were granted. Production of gypsum lath in 1941 was 1,842,583,000 sq. ft. It is now at the annual rate of only 525,000,000 sq. ft. OPA has been asked to grant relief to the inland plants. If this is done, CPA will divert the necessary quantities of gypsum paper liner to gypsum board and lath manufacturers, from the container industry."

Mica Grinding Plant

IN THE MICA MINING districts around Kingman, Ariz., producers will grind the mica as the demand for book mica has fallen off. One mill will be built by John G. Becker at the Mica Giant in Cottonwood Canyon. C. M. Sisson, John Larlow and L. P. Cote are developing the M. and P. claims where mica was mined from a pegmatite dike and sold to Colonial Mica Corp., at $6 to $12 a pound. Future production will be ground mica with occasional shipments of book mica.

Gas Fuel for Curing

THE NORTH GIRARD CONCRETE WORKS, North Girard, Penn., is drilling a well for natural gas on its property to furnish fuel for the boiler which supplies heat and steam for the curing rooms. This company is rebuilding the plant and installing a new No. 7 Stearns Joltcrete, mixer skip, and power lift truck. P. G. Richardson is the owner. K. A. Richardson is general superintendent and chief engineer. Sand and gravel and ready mixed concrete are also produced by this company.

Sell Flexicore Rights

THE FLEXICORE CO., INC., New York, N. Y., is the name of a new company which has purchased the patent rights to the well-known Flexicore reinforced concrete floor slab and roofing system from Price Bros., Dayton, Ohio. The financial interests back of the new company are identified with Corbetti Construction Co., New York, N. Y., contractors for some of the largest construction projects in the New York area. A plant has been built in New York to make Flexicore units for the metropolitan area, but the right to manufacture under the patents will be licensed to other concrete products manufacturers throughout the nation. Licenses to manufacture Flexicore also are being negotiated in Great Britain, Russia and other European countries.

Mexico Cement Additions

CEMENTOS VERACRUZ, S. A., Orizaba, Mexico, has taken steps to increase production from 200 to 300 metric tons daily, and machinery has been ordered for this program. Plastocement, S. A., an allied company producing masonry cements, will launch a construction program which will modernize the existing plant and increase capacity 50 percent.

Denied Court Review

THE UNITED STATES SUPREME COURT on October 9 denied the petition of the Longhorn and San Antonio Portland Cement Companies for review of a Fifth Circuit Court decision denying them the right of deducting from 1939 income taxes $100,000 paid in settlement of a Texas anti-trust suit. The companies contended the sum was not paid as "penalties" and therefore was deductible.

Revamp Pipe Plant

SHEARMAN CONCRETE PIPE CO., Tulsa, Okla., plans to completely rebuild its plant this Winter. The present wooden building will be torn down and a new sheet metal building will be erected. The two machines now being used will be augmented by a third machine. Pipe from 4- to 60-in. will be produced. A new boiler will also be added. The new plant will be in production by Spring of 1946.

Cement Production

BUREAU OF MINES reports that production of finished cement during August, 1945, totaled 9,921,000 bbl. or 10 percent above the output in August, 1944, and 7 percent above the July, 1945, total. Mill shipments of 11,467,000 bbl. were 7 percent higher than in August, 1944. Mill stocks continued to decline and the total of 15,940,000 bbl. at the end of August, 1945, was 14 percent below that of the corresponding month of the previous year.

The following statement gives the relation of production to capacity, and is compared with the estimated capacity at the close of August, 1945, and of August, 1944:

RATIO (PERCENT) OF PRODUCTION TO CAPACITY

	Aug. 1944	Aug. 1945	July 1945	June 1945	May 1945
The month	44.0	49.0	45.0	45.0	40.0
12 months	40.0	40.0	39.0	39.0	39.0

Pavement Yardage

AWARDS of concrete pavement for September, 1945, have been announced by the Portland Cement Association as follows:

SQUARE YARDS AWARDED

	During Sept., 1945	During First 9 Mos., 1945
Roads	733,708	4,161,728
Streets and Alleys	428,011	3,777,451
Airports	25,348	7,292,240
Total	1,187,067	15,251,419

Seeds to Ready Mix

THE SUTHERLAND SEED CO., Colfax, Wash., has announced plans for the erection of a ready mixed concrete plant to cost $12,000. The plant will be built on a site adjacent to its seed processing buildings.

Steel storage silos with tunnel conveyor for recovery at Ferrysburg, Mich., sand plant

To Make Refractory

PERMANENTE CEMENT CO. has announced that a refractory brick plant will be built at Moss Landing, Calif., near Watsonville. Present facilities at Milpitas, near San Jose, Calif., will be transferred to the new scene of operations early next year. The Moss Landing site, owned by The Permanente Metals Corporation, is now occupied by a sea water magnesia plant which supplies the Permanente Cement Co. with the bulk of its raw materials for the manufacture of basic brick. Brick presses and equipment now at Milpitas will be moved to Moss Landing. Permanente Products Co., which distributes products of other manufacturers as well as those of Permanente Cement Co., and The Permanente Metals Corp., will continue to conduct the sales and business activities of the new refractory plant from its present offices located at Akron, Ohio, and Permanente, Calif.

Build Cement Silos

MEDUSA PORTLAND CEMENT CO., Cleveland, Ohio, has obtained a permit to build six reinforced concrete silos in Milwaukee, Wis., for the storage and distribution of cement. The cost will be $95,000.

Rebuild Block Plant

RENNEKAMP SUPPLY CO., Pittsburgh, Penn., has rebuilt its block plant, installing two new 250-ton Butler bins, a Besser Super Vibrapac block machine, and a Clark power lift truck.

Bentonite

BUREAU OF MINES reports that bentonite production in 1944 was 546,768 valued at $3,605,988. The greatest producers were Wyoming and South Dakota. The increase in production was 14 percent over that of 1943, the principal expansion being in rotary drilling mud.

Buys Quarry

JOS. SANDALS has purchased 30 acres from Dr. E. G. Revare on Highway 10, five miles west of Richmond, Mo., which includes a quarry property. Another quarry on the property is not in operation due to inability to secure labor.

Make Insulating Block

L. B. and W. H. STULLER, Arlington, Wash., are making plans to produce concrete block, well tile, and plastic insulation (scovia) block. Storage facilities for two carloads of aggregates have been built.

Sell Gravel Concern

WESTERN HILLS SAND AND GRAVEL CO., Cleves, Ohio, near Cincinnati, was sold at auction recently, according to a local report. The sale included both real estate and plant equipment.

CONVENTIONS COMING

American Road Builders' Association, annual convention, Stevens Hotel, Chicago, Ill., January 14-18, 1946.

National Concrete Masonry Association, Annual Meeting, Hotel Sherman, Chicago, Ill., March 12-14, 1946.

National Crushed Stone Association Annual Meeting, Netherland Plaza, Cincinnati, Ohio, Week of January 28, 1946.

National Ready Mixed Concrete Association, Annual Meeting, Netherland Plaza, Cincinnati, O., Week of January 21, 1946.

National Sand and Gravel Association, Annual Meeting, Netherland Plaza, Cincinnati, Ohio, Week of January 21, 1946.

New York State Crushed Stone Association, Inc., and Pennsylvania Stone Producers Association, Hotel New Yorker, New York, N. Y., November 30, 1945.

Warner Improvements

WARNER CO., Philadelphia, Penn., has an extensive program for improvements during 1945 and 1946 to catch up on deferred maintenance, to make replacements as a result of the war period, and to prepare for the business expansion ahead which will total an expenditure of $1,800,000.

Expand Operations

FREY QUARRIES, in a general program of expansion, is planning to install a Bradley Junior Hercules mill at its Williamson and Mercersburg, Penn., operations in anticipation of greater agstone demands.

Gravel to Block

THE MISSOURI RIVER SAND AND GRAVEL CO., Boonville, Mo., recently installed equipment to manufacture concrete block. Present capacity is about 1,000 block per day.

Buy Gravel Concern

GIFFORD-HILL CO., Dallas, Texas, has purchased the Potts-Moore Gravel Co., Waco, Texas. "Bob" Potts, who has been intimately identified with the National Sand and Gravel Association affairs for many years, and his associates in the business are retiring. Mr. Potts will establish a consulting engineer's office.

Building Block Plant

MORTARLESS MASONRY CO., of Washington, E. Wenatchee, Wash., is building a plant which will produce a patented type of pumice concrete block which has been described in ROCK PRODUCTS. The plant will have a capacity of 6000 block per day, according to E. E. Darnell, manager.

Buy Mixer Trucks

CHAMBERSBURG STONE CO., Chambersburg, Penn., is planning to revamp its haulage system from the quarry to the plant. Recent additions to its ready mixed concrete setup are two 3½-cu. yd. Rex mixers mounted on Mack trucks. Four more mixer trucks are on order.

To Make Block

JANESVILLE SAND & GRAVEL CO., Janesville, Wis., plans to erect a 700-bbl. bulk cement storage bin and install a bucket elevator to unload bulk cement from covered hopper bottom cars.

Building Masonry Plant

THE CHEBOYGAN CEMENT PRODUCTS CO., Cheboygan, Mich., is scheduled to start block manufacturing operation on December 1. Louis L. Hillman, formerly of Flint, Mich., will own and operate the plant.

Sell Gravel Business

THE T. P. SAND AND GRAVEL CO., Milwaukie, Ore., has been acquired by G. C. and Bernice Curtner, Portland, Ore., from Roy L. and John E. Kullander.

Adds Crusher

E. J. LEEP, Hyndman, Penn., producer of gannister, has installed a new 26- x 38-in. Trayler Blake jaw crusher to meet expanding production requirements.

Enlarge Quarry

MATERIAL SERVICE CO., Chicago, Ill., has purchased 22 acres on the White river near Burlington, Wis., to enlarge the present quarry. A crushing plant will be placed on this land, according to the report.

Buy Products Concern

COYLE BROS., New City, New York, has purchased the block plant formerly operated by Mr. Ludwig at Mt. Ivy, N. Y.

HINTS *and* HELPS

Practical Ideas Developed by Operating Men

Control Conveyor Feed

ANDERSON SAND AND GRAVEL CO., INC., Rockford, Ill., has adopted a novel method to control the rate of flow of material from stockpile to

Notched plate regulates gate opening in pit. To the left is rod in closed position

belt conveyor in the Kern system of radial storage. Opening and closing of the gate below stockpile and feeding conveyor is controlled by a long vertical rod which is operated from the main floor of the building, some 30 ft. above the pit.

To control the size of gate opening, a notched steel plate was made upon which a projection in the rod could be placed, allowing any desired size opening of the gate.

Ball Stone Breaker

AFTER five years of continuous use the steel ball impact method of breaking primary blasted rock has been found to compare favorably with that of the jackhammer-dynamite method, in the operation of the Ashcom, Penn., quarry of the New Enterprise Stone and Lime Co., New Enterprise, Penn.

The rock at Ashcom is high calcium limestone (94% $CaCO_3$) with a low silica content, and although it is quite hard, it is not as refractory as some other limestones in Pennsylvania, many of which are high in silica.

A 100-ton aggregate of rock including specimens up to 25 tons in size is broken down by one operator in two hours, according to Galen Detwiler, superintendent, whereas two men using jackhammers would require three hours on the same quantity. This time estimate is based on a total of 50 drillings, with two shots needed on each 25-ton piece of rock. Idle time per shot was taken as 15 minutes, making a total of 30 minutes idle time per each 25-ton piece of rock broken, which is felt throughout the operations as reduced production. To this must be added the cost of a half box of dynamite.

The ball, which is actually pear-shaped rather than spherical, is of alloy steel weighing 3800 lb., a product of the Frog & Switch Mfg. Co., Carlisle, Penn. The many impacts flatten the bottom which eventually causes it to split in half. One replacement has been made in the five years, the purchase price of the ball equaling that of a pair of jackhammers and hose, which have a life of only two to three years according to the plant records.

Steel breaker ball showing size of rock which it has broken

Maintenance on the ball-handling shovel, which is a ⅝-cu. yd. Byers with a 35-ft. boom, compares favorably with that of the maintenance on two jackhammers, drill bits, and an air compressor.

In operation, the ball takes the place of the bucket at the end of the hoisting rope which is fitted with a swivel to prevent the rope from being twisted by the rolling action of the ball. A raise of 25 to 35 ft., depending on the size of rock to be smashed, is the usual practice, the ball being then allowed to fall freely from this height onto the target.

Prevent Clogging of Wet Sand

SIMPLE but efficient is the method devised by the Anderson Sand and Gravel Co., Inc., Rockford, Ill., for preventing wet sand from clogging the chute feeding the belt conveyor. This plant has the Kerns system of radial storage and discharge from a sand dewatering screw is to a stockpile adjacent to the storage system. Wet sand from the screw drops down so that it flows directly to the chute. To direct the sand farther from the chute and allow sand which has been partially dewatered to enter first, flaps have been hung under the discharge end of the sand dewatering screw, shown in the illustration.

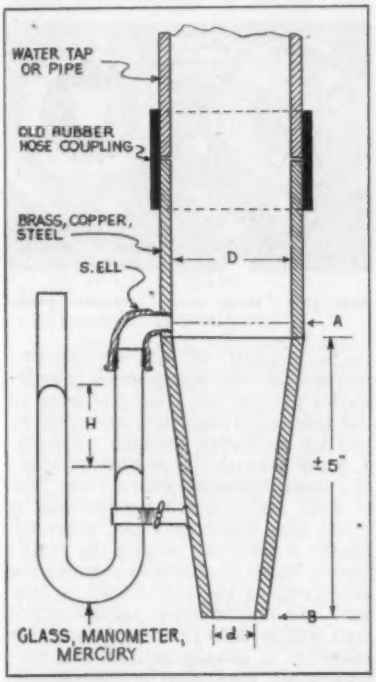
When sand is to be directed farther out in the pile, a board is pushed against the lower end of the flap, thus creating a chute, in effect, which sends wet sand where directed.

Left: Flap pushed out to send sand to back of pile. Right: Flaps hanging from sand screws in position to allow sand to drop directly to chute leading to belt conveyor

Measuring Flow of Liquids

By J. F. PRUYN

MANY PLANTS start operations with little knowledge of how much water is needed for screens, compressors, tables, rod and ball mills until they have learned just what is needed by experience. Then a simple method of



Apparatus for quickly measuring flow of liquids

measuring the flow of water periodically is sought to determine whether equipment is being operated with an optimum flow of water.

To obtain the greatest efficiency with a limited amount of water, the nozzle measuring device, shown in the illustration, has proven fast and accurate. This nozzle dispenses with the business of hauling around a portable weir or the inevitable 5-gal. drums for stop watch.

The nozzle may be put on a handle for reaching into inaccessible places. Mercury is usually used unless pressures are very low. The entire set-up can be machined easily of copper, stainless steel, or just steel for that matter, if the nozzle is cleaned after each day's testing to prevent rusting. An old piece of rubber hose is used to couple the nozzle to outlet taps.

A formula for determining water requirements follows:

$$Q = \text{ft.}^3/\text{sec.} = .79\ d^2\ \frac{\sqrt{K^2 2gHD^4}}{D^4 - K\,d^4}$$

$$= 6.29K\ \frac{D^2}{R^4 - K^2}\ \sqrt{H}$$

d = Outlet diameter in feet
K = Coefficient less than 1.0, use .95 to .99
g = 32.2 ft./sec.^{2}
H = Difference in water or mercury level, in feet

$$R = \frac{D}{d}$$

D = Diameter in feet.

Conversion of mercury level difference in inches to feet of water = mercury level minus difference in inches times $\frac{13.6}{12}$ = feet of water = H

The formula given above can be used, but it is generally easier and more accurate to calibrate and plot a curve of gallons per second of water flowing to inches of mercury (level difference) by hooking the nozzle to a tap from which the amount of water flowing can be varied.

Stone Feeder

DIFFICULTY in purchasing equipment has brought out the ingenuity and inventiveness of owners and superintendents in many plants. Typical is the use to which worn out crawler treads are put at the Lang Stone Quarry, Charleston, Ill. Mr. Lang took two sets of treads and put them together to act as a feeder for delivering stone to a primary crusher. As shown in the illustration, the treads pull stone up a short incline from the hopper at the right to the primary crusher at the left.

Old tractor treads serve as feeder to primary crusher

Hard-Surfacing Drill Bits

ELLWOOD STONE COMPANY'S sand plant at Koppel, Penn., claims remarkable results in increasing the life of drill rod for both well drill and hand drill practice. According to Mr. Pierce, superintendent, a special hard-surfacing alloy applied with an oxy-acetylene torch is the answer.

Drill bits resurfaced with special hard surfacing rod

Both 6-in. and 1½-in. bits are first sharpened by heating and blacksmithing, after which a bead of Stoody tube barium is applied, but only to the cutting edges as shown in the illustration. For the small bits a No. 30 to 40 is used and for the large, No. 20 to 30. The loss of drill rod per renovation is negligible and the wearing qualities of the cutting edge are increased as much as five times that which can be obtained by the best tempered bit. On hand drills, one rebeading is good for 60 ft. of drilling in silicious stone.

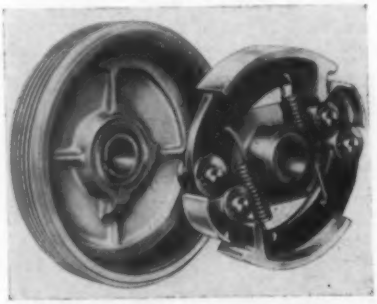
Slag Plant

HOUSTON SLAG MATERIALS CO., Houston, Texas, has set up a plant adjacent to the Sheffield steel plant on Industrial Road. Roy Hofheinz, former county judge, and Geo. A. Mattison, Jr., of Birmingham, Ala., are financially interested in the plant.

new MACHINERY

Automatic Clutch

SALSBURY MOTORS, INC., Los Angeles, Calif., has developed an automatic clutch to eliminate the sudden shock of starting machinery. It can



Clutch actuated by centrifugal force

be installed direct on the shaft of any engine or electric motor. Operated by centrifugal action, the clutch progressively applies the power to the driven machine. It engages and disengages without human control. It has been suggested for use on concrete mixers, pumps, conveyor systems, hoists, etc. Two models are available, one for the range from fractional to 3 hp., and one for up to 6 hp. Different drives can be mounted on the shaft, including V-belt or flat belt pulley, gear, sprocket, coupling, or a variable speed transmission.

Wet-Type Dust Collector

CLAUDE B. SCHNEIBLE CO., Detroit, Mich., has brought out its type "EC" multi-wash collector which combines in a portable self-contained unit the functions of the larger central dust and fume control system. This unit was developed to operate in locations which could not be conveniently served by a central dust collecting system.

Cut-away view of portable, wet-type dust collector

Equipment consists of a 3½ impingement stage multi-wash dust collector, a suction fan, a sludge settling tank, a recirculating pump, and an after-filter. These portable units are available in capacities of from 400 to 5000 cu. ft. of air per minute.

Big Haulage Unit

ATHEY PRODUCTS CORPORATION, Chicago, Ill., has announced its PD-10 trailer which is designed for use with the Caterpillar DW-10 tractor for high-speed hauling on mining, construction and other earth-moving

Trailer which discharges its 15-ton load from either side

projects. This two-way dump trailer has a maximum capacity of 15 tons. Its heaped capacity is 10 cu. yd., and struck, 8 cu. yd.

The hydraulically-controlled trailer has an approximate shipping weight of 15,000 lb. Not including the tractor, the trailer unit is 21 ft. long, 9 ft. 4 in. wide, 7 ft. 2 in. high at the rear, and 7 ft. 10 in. high at the front. It discharges its load from either side at a 55-deg. angle. Tires are 1400 x 20, 16-ply.

Gear Shift "Range Finder"

THE WHITE MOTOR CO., Cleveland, Ohio, has developed an instrument which combines the features of an ordinary speedometer with those of a tachometer and adds instructions governing various engine speeds. With this device on the instrument panel, the driver can increase the life of the engine by keeping it within its most efficient range of operation. Hitherto the driver has depended on his ability to sense the proper time to shift, but gauging the r.p.m. is extremely difficult because of the varying ratios between that and the chassis speed (miles per hour). Grades encountered and the necessity to using various transmission gears to meet different conditions provide a constant change.

With the "Economy Range Finder," as it is called, the driver can read the engine speed directly on the speedometer dial, and a spiral white line for each transmission gear is shown on the dial with a scale of

Gear shift "range finder" promotes engine efficiency

r.p.m. printed on the speedometer pointer. As the speedometer pointer moves around the dial, the edge of the pointer crosses the spiral white line for each gear, showing the r.p.m. A white area on the pointer indicates the ideal operating range from 1700 to 2400 r.p.m., and at either end is a red area which indicates when the engine is operating outside the proper range. When the pointer reaches the outer end of the spiral line for any gear, the engine speed (noted in the red) will be 2800 r.p.m., at which the governor is usually set. As this recommended maximum is approached, the bearing loads, piston speeds, and vibrations are increased, thereby tending to shorten the life of the engine. By the same token, the red at the lower end of the pointer shows when the engine is laboring and in need of relief through shift to a lower gear.

Cable-Controlled Dozers

CATERPILLAR TRACTOR CO., Peoria, Ill., is now in production on its line of cable-controlled bulldozers and scrapers with the lifting of W.P.B. restrictions. Delivery of bulldozers for Caterpillar Diesel D8, D7 and D6 track-type tractors is scheduled late this year with delivery of the scrapers in several sizes scheduled for early 1946, according to a recent announcement. Manufacture of the bulldozers and scrapers marks this company's entry into the field. Advantages

One of the new model bulldozers

claimed for the bulldozers are: balanced design, great capacity, rigid construction, elimination of "A" frame, reinforced blade, enclosed operating cables, easy blade adjustments, high lift, low drop, and straight or angling cut.

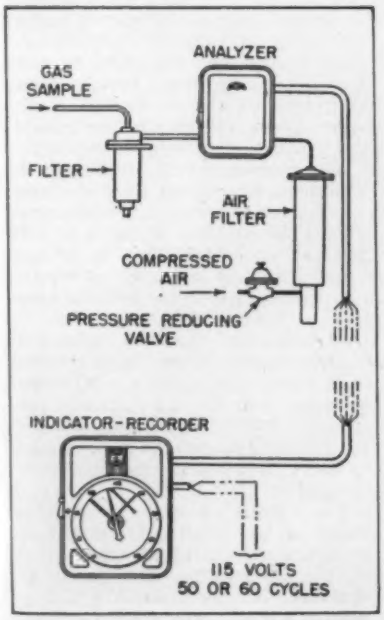
Salt Dispenser

THE MINE SAFETY APPLIANCES CO., Pittsburgh, Penn., has made available to industry its M. S. A. molded plastic salt tablet dispenser. It features easy one-hand operation, providing one tablet at a time, every time, with each fractional turn of the dispensing knob. It has a 1500-tablet capacity. Quick-dissolving standard 10-grain sodium chloride tablets or combination sodium chloride and dextrose tablets are available for use in the dispenser.

Automatic Analyzer

BAILEY METER CO., Cleveland, Ohio, has brought out an automatic analyzer and recorder for indicating, recording and controlling the combustibles content of a gaseous mixture. This instrument has been applied to precision control of furnace atmospheres and chemical processes. The analyzer and recorder provide a continuous graphic analysis almost instantly, and they are said to be responsive to changes of .05 percent combustibles; sustained accuracy is within .25 percent.

In operation, a continuous gas sample is mixed with compressed air and burned on a catalyst-filament which reaches a temperature proportional to the combustibles content. Since the filament resistance is a function of temperature, a simple resistance bridge connected to a null-balance electronic recorder completes the installation. It may be calibrated in percent combustibles, mixture ratio, or other desired terms. Pneumatic control or electric alarm contacts may be provided on both one and two-pen recorders. A two-pen recorder utilizes separate analyzers so that the speed is not impaired by switching, and the two records are independent of each other.



Combustible analyzer and recorder

Wire-Corded Tire

THE FIRESTONE TIRE AND RUBBER CO., Akron, Ohio, has developed a wire-corded heavy duty tire which it is claimed is nearly blowout proof.

Tire cut away to show metal fabric of which the cord body is composed. L. R. Jackson, executive vice-president, is pointing to the wire cord

Fine metal wire cord with a very high tensile strength is firmly bonded with rubber to provide the foundation of the new tire. Every cord in every ply is five times as strong as the strongest cord heretofore used in conventional tires, states the announcement. Because of the strength of the metal, it is said that fewer plies are required, and the walls of the tire consequently are thinner. This contributes toward cooler running.

Heavy-Duty Shovels

THE THEW SHOVEL CO., Lorain, Ohio, has announced four new heavy-duty shovels and cranes designated as the Lorain "41" series, one of which is a chain-drive crawler machine and three are rubber-tired machines. Of the rubber-tired machines, one is equipped with 4-wheel drive, one with 6-wheel drive and a third is of the self-propelled type.

The two-speed, crawler machine features a new mounting that is longer, wider and heavier. Standard

Chain-drive crawler shovel

treads are 30 in. in width and travel speeds in either direction are ¾ and 1⅝ miles per hour. Steering is done from the cab in any swing position of boom. Tread and travel lock is of the positive, four-way ratchet and pawl type. The unit, which is convertible to shovel, crane, dragline, clamshell or back-digger, is said to have increased crane, clamshell and dragline capacities.

Drop Feed Oiler

OIL-RITE CORPORATION, Milwaukee, Wis., is offering a drop feed oiler for heavy duty applications which combines visibility and adjustability in a small unit. This oiler can be used wherever small capacity feeding is required, and is said to be especially suitable for very slow or medium feeds.

Oil is fed by gravity through an oil port which can be adjusted within a wide range. It can be wide open, providing a steady flow of oil or it can be closed entirely. The rate of feed remains practically constant regardless of oil level. The oil port is a little above the bottom of the reservoir. Dust and dirt can, therefore, settle and will ordinarily not enter

Adjustable oiler has visible plastic reservoir

the port. An oil filter can be placed over the oil port, preventing any impurities entering the bearing and prolonging the life of the bearings.

Left to right: Main plant of American Aggregates Co., at Richmond, Ind., belt conveyor from crushing unit, and belt conveyor from surge storage pile (raw material). Conveyors are all covered

Build Up Large Reserve Storage

Recent improvements of American Aggregates Corporation, Richmond, Ind., plant include electrified haulage system and more crushing capacity

By BROR NORDBERG

AFTER 22 years operation, principally in the production of railroad ballast, the Richmond, Ind., sand and gravel plant of the American Aggregates Corp. was completely rebuilt in 1943. When originally built alongside the Pennsylvania railroad, the plant was strictly a ballast operation, but over the years there had been an ever increasing trend toward the production of more commercial grades of gravel and sand.

It was rebuilt into a versatile production unit that produces some 12 grades of commercial aggregates, in order to meet the trend toward a greater variety of products and the numerous specifications in Indiana and Ohio requiring various percentages of crushed material and combinations of crushed and uncrushed gravel. It was also desired to have greater storage both of raw material and finished products, and the facilities for producing a cleaner, better product than the old plant could produce.

Impact crusher which reduces pea gravel for the production of more fines

Designed capacity of the plant is 250 tons per hour of concrete aggregates for highway construction, road gravel for county roads, surface treating materials, street materials, berm materials, various grades for bituminous mixes and railroad ballast and sub-ballast. This represents an overall increase of approximately one-third in capacity, but actually more ballast can be produced than the earlier plant could handle. About 60 percent of the production is railroad ballast. The bulk of the remaining production is shipped by truck.

The engineering department of the American Aggregates Corp. designed the new plant and it was constructed during the winter and spring of 1943. Production started June 15 of that year. The new plant is all electric and was erected on the original foundations for the old plant. However, the excavation has been shifted to another section of the deposit, which is of terminal moraine glacial origin, in order to deliver an increased percentage of crushable sized pebbles to the plant. Approximately 50 percent of the gravel put through the plant is crushed.

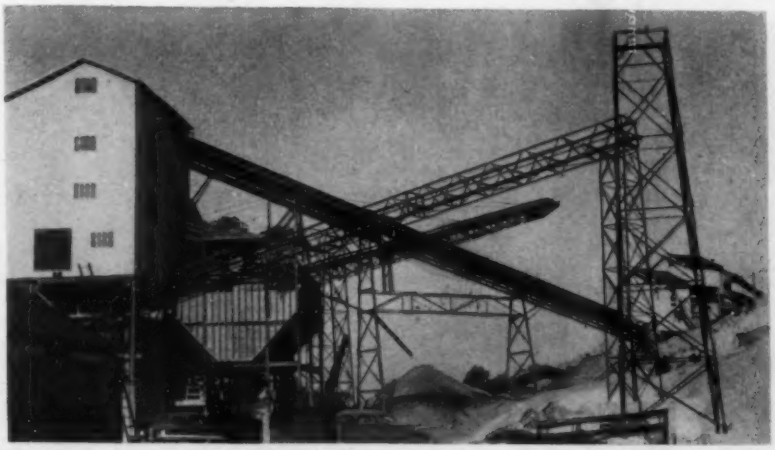
The plant design incorporates many of the general features more or less standardized at other plants of the corporation throughout the midwest. Among them are a large reserve storage capacity for unprocessed raw materials adjacent to the

plant, to insure a steady source of feed and to provide a reserve against shutdowns in the excavation for any reason. The plant is equipped with a large capacity scrubber-trommel screen, has an impact crusher for the reduction of pea gravel to finer sizes and plenty of head-room over the bins which permits great flexibility in blending materials as they are placed into the bins. All of the company's plants feature a maze of pipe, chutes, by-passes and butterfly arrangements over the bins that can be cleverly manipulated to arrive at any desired product size.

Electrify Entire Operation

Excavation is now proceeding approximately one-half mile from the plant. In electrifying the entire operation, a 3½-cu. yd. 24-B Bucyrus-Erie steam-driven dragline was rebuilt entirely into an electric machine. The pattern of excavation and method of haulage are almost identical to the principles followed in other plants operated by the company.

The dragline fills a 90-ton capacity field hopper which is portable and straddles standard gauge track. A sloping rail grizzly over the hopper rejects boulders bigger than 18 in. The 40-ton steam locomotive which formerly hauled two 30-ton capacity bottom-dump ore cars to the plant has been replaced recently by a Diesel-electric locomotive built in the company's shops at Greenville, Ohio. It has a 500-hp. Cummins Diesel driving a G.E. generator which supplies power to the driving motors. This unit, which is similar to other Diesel-electric locomotives operated by the company, will pull three 35-ton cars, increasing capacity of the plant. The operator presses electric switch buttons at the hopper to actuate Curtis pneumatically-operated bin gates to fill the cars.

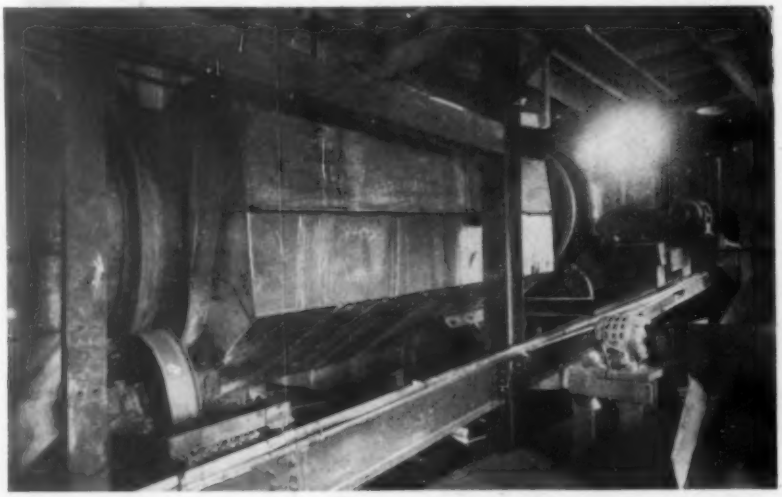


Main screening and crushing plant showing recently built stockpiling conveyor belt structure

Adjacent to the plant, the cars are emptied through a trestle into a hopper free-flowing storage area over a 30-in. tunnel belt conveyor. Free-flowing capacity is 400 tons. The bank-run material is fed onto the belt by a Jeffrey-Traylor vibrating feeder. Total storage is 1500 tons which can be handled from and to the drawoff point by clamshell. However, normal practice is to feed the plant material that flows directly onto the belt, without rehandling in storage.

Two 30-in. belt conveyors, each with Stearns idlers and covered with

Overall view of new plant. Railroad bins on left, truck bins to the right with stacking conveyor for minus ¾-in. bituminous sand and gravel material. Other conveyor is from crusher near surge raw material storage



Scrubber-trommel scalping screen is 5 ft. in diameter with an 8-ft. scrubber section to the right. Three screen barrels have 1⅜-, ¾-, and ¼-in. round opening screening, from the inside to the outside of the scalping screen

Showing railroad bin arrangement, piping and chutes, and a belt conveyor for direct handling of one product. Plenty of headroom permits great flexibility in filling bins

Close-up of three-beam weigh batcher for proportioning sand and gravel into batching trucks

galvanized iron sheets to protect the belting, deliver the pit run material to the plant. The conveyors are on 180- and 210-ft. centers, respectively, and there is a crushing unit at the half-way point. Conveyor No. 1 discharges over an inclined rail grizzly, with 4-in. spacings, just ahead of a 15- x 30-in. Buchanan jaw crusher. Plus 4-in. cobbles are crushed and the crusher product joins the bypassed minus 4-in. material on the second belt conveyor for delivery to the screening plant.

The first step in screening is passage of all material through a 60-in. diameter trommel screen with an 8-ft. scrubber section at the feed end. There are lifting blades inside the scrubber section for breaking down any clay balls. Much of the wash water, furnished by two 8-in. centrifugal pumps, is applied in the scrubber-screen.

The trommel screen has three barrels, with 1⅜-, ¾- and ¼-in. circular openings in perforated plate, respectively, from inside barrel to outside. In addition, there is a hangover section with larger perforations in order to permit taking off larger pebbles (1½- to 1⅜-in.) for ballast, or sizes for large concrete gravel.

Under the trommel screen are two 4- x 8-ft. triple-deck Simplicity vibrating screens for further sizing and re-washing. Generally, plus 1⅜ or 1½-in. gravel discharges onto a picking belt conveyor and then through a chute into a 48-in. short-head Symons cone crusher on the lower plant level, just over the bins. A Symons disc crusher will be replaced with a new No. 4 Symons standard cone crusher. Normally, it will take oversize from 3- to 6-in. stone, but in case of emergency it can be set up to take the entire feed.

Crushed gravel is elevated by bucket elevator to a 4- x 8-ft. two-deck Simplicity vibrating screen for sizing, usually with 1½-, ¾- and ⅜-in. square openings on the successive screening decks. Oversize can be returned to the crusher or be diverted into ballast or other product bins.

Under this screen is a 5- x 10-ft. triple-deck Allis-Chalmers horizontal screen which is used only when it is necessary to wash crushed gravel. Otherwise it is inoperative. This screen generally carries ¾-, ⅜- and ⅛-in. screen openings and, when used, the fines (crusher dust) are diverted into the sand flow.

One of the two screens under the trommel screen is termed a "rewash" screen. Plus 1½-in. gravel or 1⅜- to 1½-in. gravel from the trommel screen can be washed over this screen. Generally, the feed is 1⅜- to ¾-in. gravel which may be further re-sized, to make a minus ¾-in. to dust product used extensively for bituminous mixes. Or the ¾- to 1⅜-

Dragline with 3½-cu. yd. bucket has been rebuilt from steam to all-electric power

crusher for reduction to minus ¾-in. but, usually, the ¾- to 1⅜-in. goes into ballast.

The second vibrating screen, for uncrushed material, is the "pea gravel" screen. It carries ⅜-, 3/16- and ⅛-in. screen openings, to produce a 3/16, to ¼-in. pea gravel and a shot sand, ⅛- to 3/16-in., for seal coat material. Minus ⅛-in. is diverted into a widened out sand drag to make mason's sand. Minus ⅛-in. crusher dust from the crushed gravel washing screen is also diverted to the sand drag, since some specifications require 3 to 6 percent minus 100-mesh fines in the sand. Small amounts of concrete sand are usually made by blending mason's sand with shot sand from the pea gravel screen. Otherwise the ⅛-in. screen deck can be blanked off and a coarser sand be diverted to the sand drag.

It was mentioned earlier that one important specification being filled (for bituminous mixes) calls for a minus ¾-in. product. It is required that crushed as well as uncrushed material comprise the product, including pea gravel and shot sand sizes and all the crusher dust. It is specified that the product contain 3 to 8 percent minus 200-mesh dust. To build the percentage of fines the cone crusher is set up tight and pea gravel is put through a 24-in., 1400 r.p.m. Greenville impact crusher to make fines. The crushed gravel washing screen is by-passed, and the various sizes comprising the product are blended on a 24-in. stacking belt conveyor which builds up a stockpile. This product is loaded into trucks by a Barber-Greene loader, for shipment.

Another recent addition to the plant in the Fall of 1945 is a 24-in. conveyor, 140-ft. centers, which will make possible additional storage of 10,000 tons of finished material known as No. 9, which is 3¼-in. down, allowing 5 percent through No. 8, 50 percent crushed, for hot and cold bituminous mixes.

Produce Large Volume of Ballast

Storage capacity in six bins is 1000 tons, which is supplemented by four truck-loading bins which are filled by belt conveyors. One rail-loading bin is set aside for railroad ballast. The plant produces two classes of railroad ballast and bank-run sub-ballast. The specification calls for a washed ballast, with 100 percent minus 2-in., 15 percent retained on a 1½-in. sieve, 20 to 30 percent, plus 1-in. and a limit of 15 percent passing the No. 4 sieve. Class A ballast specifies that there be 41 to 100 percent

The specifications are met by combining four plant products through chutes into the ballast bin. They are a ⅜- to 1½-in. crushed, washed gravel, 1⅜- to 1½-in. uncrushed gravel, 3/16- to ¾-in. uncrushed gravel and pea gravel. Ballast and other washed materials are re-washed over screens when cars are loaded.

Special truck bins, with a weigh batcher, were built for concrete gravel, road gravel and two grades of sand. The weigh batcher is a 1½-cu. yd., 3-beam J. N. Kinney batcher which is used for proportioning aggregates into batch-type trucks. Surplus sand is by-passed the bins through a pipe for outside storage and loading by portable truck loaders. Fred M. Lamb has been superintendent of this plant since 1937.

Mineral Resources of California

A NEW BOOK, Bulletin 130, entitled "Economic Mineral Resources and Production in California, A Survey with Reference to Postwar Employment," prepared by Samuel H. Dolbear, consulting mining engineer, is announced by Walter W. Bradley, State Minerologist of California. This publication, which reviews past yield and future potentialities can be obtained from the office of the Division of Mines at the Ferry Building, San Francisco 11; State Office Bldg., Sacramento 14; and State Bldg., Los Angeles 12, for $2.00 postpaid, plus 5 cents sales tax for Californians.

Block Piler

McCRADY-RODGERS Co., Pittsburgh, Penn., recently placed in service a Warren yard stacker at its block plant at Braddock, Penn. This machine stacks standard block nine-high at one lift. Increased demand for block has necessitated an expansion program at this plant which includes a new 120-ton aggregate bin, a new 1500-bbl. three-compartment Butler cement bin, and a Besser Super-Vibrapac machine.

Open Agstone Quarry

CHARLES HAMILTON recently purchased 111 acres four miles west of Palmyra, Mo., and plans to open a quarry on the property. Mr. Hamilton explained that this move was made necessary by inability to secure limestone of sufficient quality in Monroe county, most of the deposits being too soft or too impregnated with flintrock for agricultural limestone.

Mineral Powders

HIGHWAY RESEARCH ABSTRACTS, February, 1945, quote H. Walther in Kolloid Zschr., 1943, on certain mineral powders which when added to bitumen raise the softening point, lower the breaking point, increase resistance to flow at high temperatures, reduce brittleness at low temperatures, etc. Structural viscosity for any given ratio of mineral powder to bitumen is greatest in mixtures of coal-tar pitch and micro-asbestos.

Dolomite Deposits

U. S. GEOLOGICAL SURVEY has published a map of a reconnaisance made of 116 dolomite deposits of the Western States. Data gathered includes grade, quality and tonnage of the various deposits as well as proximity to railroads, availability of electric power, gas, carbon, quartz, etc. California, Nevada and Washington contain the largest deposits.

Celestite

SHIPMENTS of all grades in 1944 was 60 percent less than that of the previous year, according to the Bureau of Mines. Consumption of both the foreign and domestic mineral was about 6000 short tons in 1944 as compared to 13,387 in 1943. The reduction is attributed to the decline in the principal source and will probably continue so after the war, as domestic deposits are too impure to compete.

IMPACT Primary Produces Cubical Products

McCorkle Stone Co., Milroy, Ind., produces large volume of agricultural limestone

By R. S. TORGERSON

Drilling 4-in. holes for blasting

When the old quarry on the outskirts of Milroy, Ind., had been worked out after 20 years of operation, the McCorkle Stone Co., located a strata of dolomitic limestone about four miles west of Milroy. A new crushing and screening plant was erected and quarry operations were started in July, 1944.

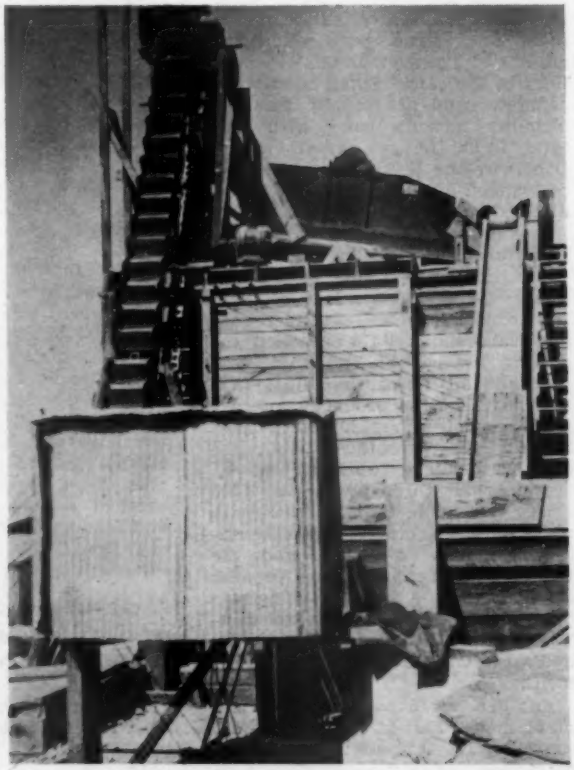
Stone from the new quarry is particularly valuable for the production of agricultural limestone as it has a very high availability test, and it also makes a good concrete aggregate. Strata varies from 4- to 6-in. ledges up to massive rock 4 ft. in thickness. At present the quarry face is 18 ft. high, but eventually it is planned to go to a depth of 28 ft. Overburden runs from 2 to 4 ft. and is generally removed with tractors and LeTourneau equipment which is hired. However, part of the stripping is done with shovels and trucks.

Drilling and blasting practices vary considerably with the character of rock formation encountered, the spacing of holes being determined by whether the stone is in thin ledges or massive rock. A Bucyrus-Armstrong machine drills 4-in. diameter holes, and the blasting charge is a 40 percent Trojan dynamite fired with Ensign-Bickford Primacord. When necessary in massive rock, Ingersoll-Rand jackhammers are used for secondary drilling, but generally the breakage permits convenient handling by a ½-cu. yd. Insley shovel to trucks for haulage to the plant. Another ½-cu. yd. Insley is used at the plant for truck loading and stockpiling.

Crushing and Screening

Perhaps one of the most unusual crushing operations in the industry

Left: Truck dumping stone into hopper from which it is fed by vibrating feeder to double-impeller type crusher



Right: Throughs from crusher are carried by bucket elevator to double-deck vibrating screen, oversize on top deck returning to crusher

is to be found at this plant. Trucks from the quarry dump from a ramp to a hopper equipped with a 30- x 84-in. Jeffrey vibrating feeder which gives a uniform feed to a 30- x 30-in. New Holland double-impeller crusher. This crusher was described in detail in ROCK PRODUCTS, October, 1944, page 61. Essentially it is an impact crusher with two large impellers operated clockwise and counter clockwise by electric motors with the tops of the impellers running away from each other. Rock, entering from the side or top is struck by the impeller bars traveling at speeds varying from 300 to 900 r.p.m. The interesting part of this operation is that the New Holland machine functions as a primary crusher, capable of taking stone up to 30 in. At present about 40 tons an hour is handled, but, according to the company, the crusher will easily handle 100 tons an hour of stone from 30 in. down to 1 in.

Throughs from the New Holland crusher are elevated by belt bucket elevator, 40-ft. centers, and chuted to a double-deck Diester Plat-O screen with the top deck having 1-in. openings and the lower deck a ⅛-in. Tyrod slot type screen. Minus 1-in. plus ⅛-in. goes to a 35-ton surge bin from which the secondary crushing plant takes its feed. The minus ⅛-in., or agricultural limestone, through the second deck goes directly to a bin for truck loading. Oversize from the top deck of the screen is returned by a short belt conveyor, at right angles to the end of the top deck, and then chuted to the crusher. A slotted ⅛-in. screen is used on the second deck to get maximum screening production. As the crusher product is cubical in shape, there is no trouble from slivery particles with this type of screen.

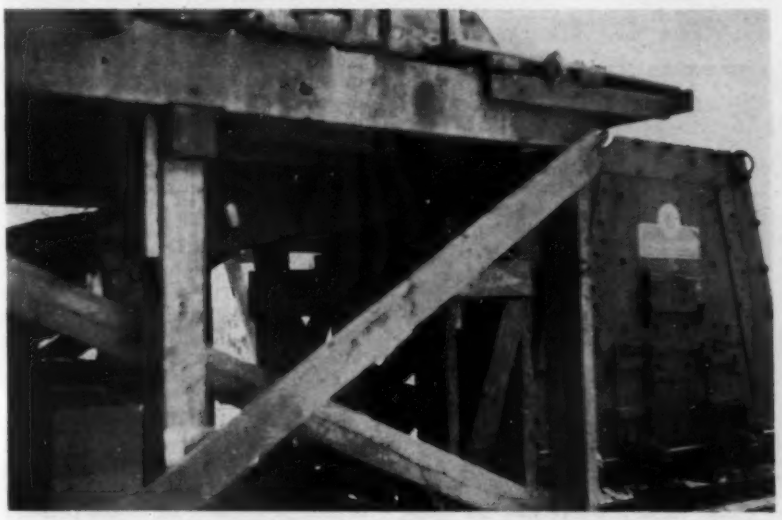
From the 35-ton surge bin, the minus 1-in. plus ⅛-in. is elevated by bucket elevator to a triple-deck Niagara vibrating screen in the screen house for sizing and thence into bins. When the entire plant is producing agricultural limestone, the minus ¾-in. plus 1-in. stone is chuted to a No. 19 Kennedy gearless crusher set about ½ in., which is in closed circuit with the triple-deck screen. The minus ¾-in. from the New Holland crusher and also the throughs from the Kennedy crusher go to a 50-ton surge bin.

View of quarry with plant shown in background. Trucks haul stone from quarry to plant over ramp, to the right

One of the spreader trucks used in hauling agstone to the farms

This surge bin feeds a 36-in., two-cage Stedman Disintegrator which produces from 30 to 35 tons an hour of material with about 85 percent passing an 8-mesh screen and 40 percent minus 100-mesh which permits meeting agricultural limestone specifications without screening. Wear on this mill does not change size of product. From the Stedman Disintegrator, a chain bucket elevator, 35-ft. centers, takes the agricultural limestone to a 30-ton storage bin for truck loading. Trucks may also be loaded from the 50-ton surge bin when these sizes are desired. When making blacktop material, either a ⅜-in. to ⅛-in. or a ½-in. to ⅛-in. size can be taken from this 50-ton bin.

Before the impact type crushers were installed, hammermills were used. Installation of the New Holland crusher also has increased the capacity of the Stedman and Kennedy crushers as these secondary crushers have a feed of cubical instead of slivery particles.



Electric vibrating feeder provides a uniform flow of stone to crusher

Increasing Capacity

By adding a larger shovel in the quarry, the plant capacity for the production of agstone has been increased from 40 tons an hour to 60 tons an hour. Since this plant was inspected the company has taken delivery of a ¾-cu. yd. Unit Crane & Shovel machine, and has been able to maintain the 60 tons per hour production. Larger drill holes for blasting also are under consideration to increase capacity.

All plant equipment is electrically operated, power line voltage of 6900 volts a.-c. being reduced by transformers to 220 volts. The Insley shovels are gasoline-engine operated, and the Bucyrus-Armstrong drill, mounted on a Ford truck chassis is driven by an International gasoline engine. It is estimated that with 60

(Continued on page 87)

Batching

Make Both Ready Mix and Lime Mortar.

Fort Worth Sand & Gravel Co., Fort Worth, Tex., operates 30 transit mixers to haul ready mixed concrete and lime mortar

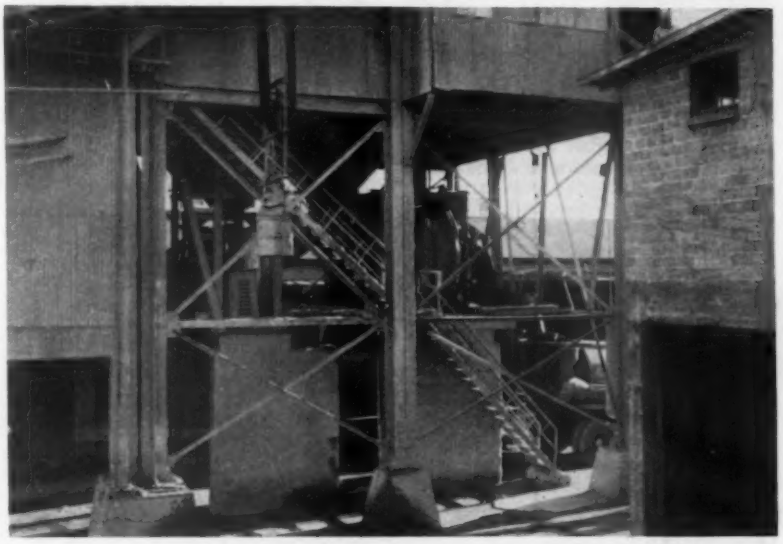
By H. E. SWANSON

Locomotive crane used for stockpiling aggregates for concrete plant and lime-mortar plant

MAINTENANCE of equipment is of greater importance now than ever before. Many producers have had to curtail production simply because equipment and repair parts could not be replaced. The Fort Worth Sand and Gravel Co., Fort Worth, Texas, has been highly successful in keeping its ready-mixed concrete plant in production at a maximum by virtue of a well-stocked and well-staffed repair shop. A fleet of 30 trucks and transit mixers has been kept in constant operation by this maintenance.

Plant Details

The repair shop, adjoining the concrete plant, is equipped with a complete set of tools, a battery charging line, a complete line of parts and supplies, and a Hess chain hoist. The hoist, which moves on a tramrail, lifts motors out of trucks, etc. A portable Schramm air compressor is also part of the plant equipment. Two mechanics are regularly employed to keep equipment in repair. All kinds of work can be done on trucks and agitators except cylinder and crankshaft grinding. When such work is necessary, it is done in local garages.

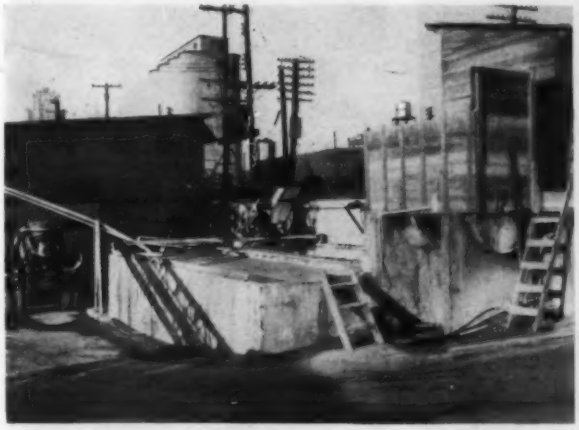


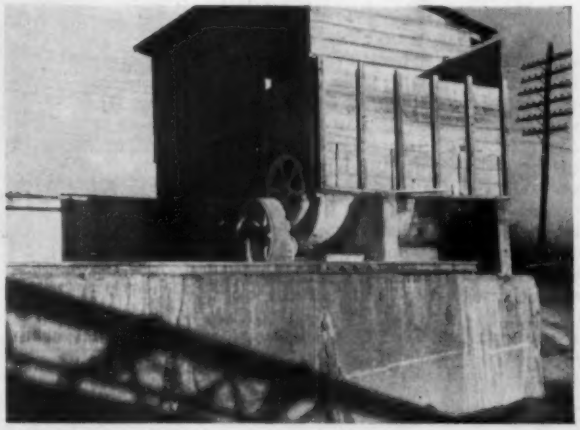
Mixing platform in batching plant, one mixer for concrete and the other for lime-mortar

An unusual feature in the ready mix plant arrangement is provision for making and loading lime mortar. Raw lime is ground and mixed with water in a small plant adjacent to the main mixing plant, as shown in the accompanying illustration. Lime putty is aged in two concrete tanks, 6 ft. deep, 12 ft. wide, and 24 ft. long. A Gould pump, powered by a 25-hp. motor, sends the putty through a 4-in. pipe to the mixing platform of the main plant. Putty is received in a measuring hopper, equipped with a float valve to determine the amount, before discharge to a 1-cu.yd. Ransome concrete mixer, where it is made into mortar with the addition of sand. Sand is sent to this mixer through a pants-leg chute from the weigh batcher in the Heltzel bin arrangement. The other leg of the chute charges the concrete mixer used for the production of concrete. After mixing putty and sand, the mixer discharges to trucks under the mixing floor.

A corner in the well-equipped shop which has been a major factor in keeping plant and equipment in service in spite of wartime restrictions. Note neat arrangement of board to hold tools

Aggregates for the production of ready-mixed concrete are received from the sand and gravel plant owned by this company. Rail delivery is used principally but truck delivery is also available. Stockpiles are main-





Left: Lime putty ageing tank with lime mixing tubs, to the right. Right: Close-up of lime putty mixer tub

tained over a concrete underground reclaiming tunnel. Six different sizes of aggregates are kept in stock at all times, each pile having a chute feeding to a 24-in. Barber-Greene belt conveyor, 300 ft., centers, housed in the tunnel. Aggregates are stockpiled from cars by a steam-powered Brownhoist locomotive crane, with a 1¼-cu.yd. bucket. In addition to the six chutes under the stockpiles, two other chutes, one at either end of the tunnel, are available to receive special sizes of aggregates. The belt conveyor is reversible, thus allowing the tunnel to be cleaned when necessary. Foreign material is placed on the belt and sent to the head end of the tunnel where the crane removes the debris.

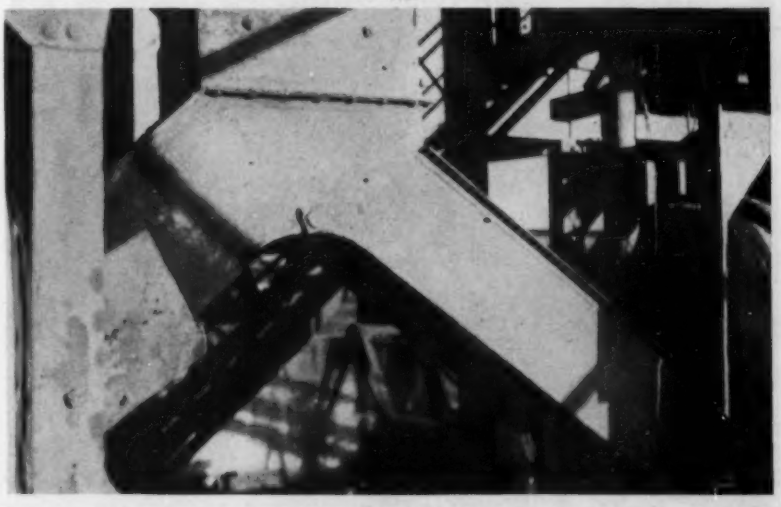
Batching and Mixing

Aggregates received on the conveyor are sent to another 24-in. Barber-Greene conveyor, 194 ft., centers, which carries the material to a 6-compartment Heltzel bin, or to another 24-in. Barber-Greene conveyor, 69 ft., centers, for transfer to another 6-compartment Heltzel bin. The first bin is for dry batching and the second is for ready mixed concrete. A swivel chute allows either the first bin or the belt conveyor to be charged.

Bulk cement is received in box cars and hopper-bottom cars. A power shovel draws the cement from the box cars to a screw conveyor feeding a bucket elevator for discharge to cement bins. A Mall vibrator attached to a motor drive feeds cement from hopper-bottom cars by gravity. The cement handling system consists of Heltzel bins and Link-Belt bucket elevators.

Aggregates, cement, and water (received from the city water supply) are mixed in a 2-cu. yd. Lakewood mixer, located on the same floor as the Ransome mixer which mixes the lime mortar.

Long conveyor moves aggregates to batching plant bins with cement transported up to bin by bucket elevator, to the left. To the right may be seen lime putty tank with pipe inclining up to lime-mortar mixer

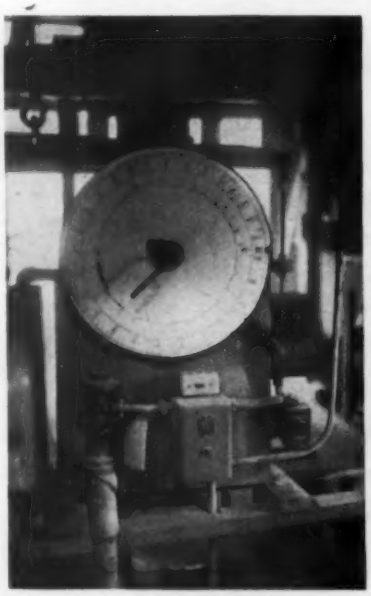


Pants leg chute with sand diverted to the right to concrete mixer and to the left for lime mortar mixer. This arrangement conserves space on mixing platform

Method of Introducing Admix

Late in 1944, automatic dispensing equipment was installed to add pozzolith to the batch. This innovation was introduced to provide an added service to customers and to improve the quality of the concrete. Pozzolith is a deflocculating agent as well as an air-entraining and water-reducing agent. To quote from a bulletin issued by The Master Builders Co., producers of pozzolith: "Cement, when placed in water, normally flocculates and is dispersed by the action of calcium lignosulfonate, the basic ingredient of pozzolith, and the mechanism by which cement dispersion is accomplished is mutual repulsion due to the adsorption of like electric charges on the surface of the cement particles, causing them to deflocculate, so that full cement area is subject to hydration."

Introducing pozzolith to the mix is not a haphazard arrangement. Strict attention is paid to the exact amount to be added, in line with the policy of rigid adherence to the principle already established of exact measurement of all aggregates, cement, and water that is put into the mixes. Pozzolith is received in bags and is put into two 600-gal. tanks together with the proper amount of water. The proportions used are .6 lb. of pozzolith to one quart of water. A chart has been made which shows the ratio of pozzolith to water, which allows the tanks to be refilled at any time, even though they are not completely empty. No stirring or agitation is necessary, since the pozzolith readily dissolves in the water.



Left: Dial calibrated in pounds and sacks governs amount of air-entraining agent put into tank. Push button at lower right opens electric valve at left. Timer above push button governs length of time valve remains open. When valve closes, motor starts sending air-entraining agent into tank again. Right: Rear view of tank containing air-entraining agent which is pumped through pipe at right into tank

Two cubic yard mixer dumping to transit mix truck

The room in which the tanks are located is on a floor directly beneath the batching floor, and the admixture is pumped from the tanks, through a 1-in. pipe, by a centrifugal pump, powered by a 1-hp. Deming electric motor. It is pumped into a 30-qt. batching tank from which it is delivered to the mixer. A dial, graduated in pounds and bags, governs the amount of liquid that is sent to the mixer. Attached to the shaft on which the dial is fastened, is a cable which is attached to a 2-in. pipe, set at an angle in the tank. The movement of the dial lowers or raises this pipe, which thus governs the amount of liquid sent into the mixer. When the admixture is ready to be introduced into the mixer, the operator presses a push-button which opens an Asco solenoid valve, allowing the liquid to flow into the mixer. The length of time that the valve remains open is governed by a Cramer timing switch which automatically starts the pumps, when the valve closes. This fills the tank again in preparation for the next batch. An overflow on the side of the tank sends the excess liquid over an automatic mercury switch, which is tripped, thus shutting off the pump and halting the flow into the tank. The overflow returns to the storage tanks through a 1-in. pipe.

This exact method of measurement assures the proper amount of pozzolith to be sent to the mixer. It is introduced simultaneously with the cement, aggregates, and water, into a 2-cu. yd. Lakewood mixer.

(Continued on page 87)

OPERATING TRENDS

In the Rock Products Industry

By HERBERT E. SWANSON and NATHAN C. ROCKWOOD

MICHIGAN APPEARS to be a good place to study geology, for taking Northern and Southern Peninsulas together, there are many varieties of igneous, metamorphic, and sedimentary underlying rocks. In the Southern Peninsula only sedimentary bed rocks are found, outcropping around the edges of a fairly well defined basin in the center of the State, containing the most recent deposits of sandstone, shale, limestones, gypsum, salt, coal and petroleum. The Northern Peninsula has numerous outcrops of highly mineralized igneous bed rock, akin to the Canadian Shield, where outcrops are found of some of the world's most ancient surface crust. Metamorphosed sedimentary as well as igneous rocks make up a large part of the western end of the Peninsula.

Like the other North Central States, the land in what is now Michigan was inundated at several periods in geologic history by inland salt-water seas. It was the vast accumulations of gravel, sand, mud, and lime deposited in these seas that formed the bed rocks under most of the State. A long time after the sub-tropical inland seas disappeared there came glaciers, which advanced and receded several times across this State, leaving a greater variety of drift than probably is found elsewhere. Into the central part of the continent glaciers flowed from two directions—from the northeast, the Labrador ice sheet, and straight out of the north, the Keewatin ice sheet. The land in what is now Michigan got its ice from the Labrador glacier; and, as we shall see when we discuss the geology of Wisconsin, this glacier did not leave as durable gravel behind as the Keewatin glacier did.

When the glaciers melted and receded to the north they left a series of great fresh water lakes, which changed their shore lines a number of times, according to the stage or period of glaciation. These ancient shore lines in many places are marked by sand or sand and gravel deposits. Also, of course, the melting glaciers produced many streams, rivers and small lakes which deposited sand, gravel and mud along and around their beds. The surface of the Southern Peninsula had been eroded before the Ice Age, but the present hills, valleys and lakes are the results of deposits of glacial drift, except around the rim of the central basin, where outcrops of limestone and dolomite of much older formation occur. These outcrops are practically the only sources of commercially valuable crushed stone, except crushed gravel.

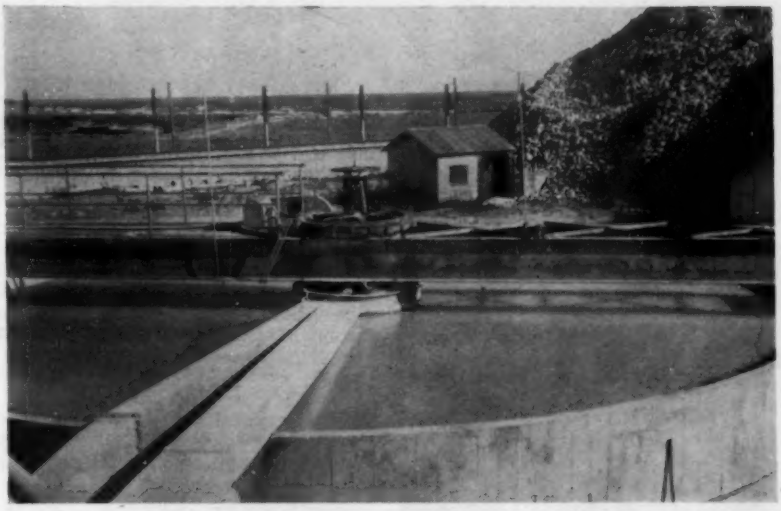


Fig. 1: A 40-ft. diameter hydroseparator or thickener recovers a desirable percentage of fines in the stone sand product, Inland Lime & Stone Co.

Michigan a completely glaciated area with a variety of coarse aggregate minerals

Glacial Drift Materials

Glacial drift contains material from many sources. The Labrador ice sheet, for example, traveled some 1600 miles, picking up and carrying pieces of surface rock all the way along. The longer the material was carried the more it was ground up, so that some of the larger pebbles in glacial drift are as apt to be pieces picked up from nearby bed rock as from faraway places. Most of the bed rock in central Michigan, as already noted, are sandstones, limestones and shales of recent origins. Consequently, although sand and gravel deposits are found nearly everywhere, good hard, durable gravel pebbles are generally so mixed or diluted with sandstone, shale and chert pebbles, that gravel good enough to meet State highway specifications for the highest class of concrete pavement is relatively rare. The sand, however, is generally of excellent quality, when properly washed and sized.

Along the eastern shore of Lake Michigan are immense deposits of wind-blown sand, the famous Dunes, which are sources of both molding and glass sands and to a less extent for construction material. These contain little gravel, and where sand and gravel are processed along the Lake shore, the material comes from present or ancient flood planes or stream beds.

There are in the southeastern corner of the State, in Wayne and Monroe counties, quite extensive deposits of very pure silica sand, of the Silurian period, probably ancient dunes or beaches. These sands are said to contain less iron oxide than deposits in other parts of the country and are utilized for plate glass manufacture.

The Northern Peninsula has any quantity of good aggregate material,

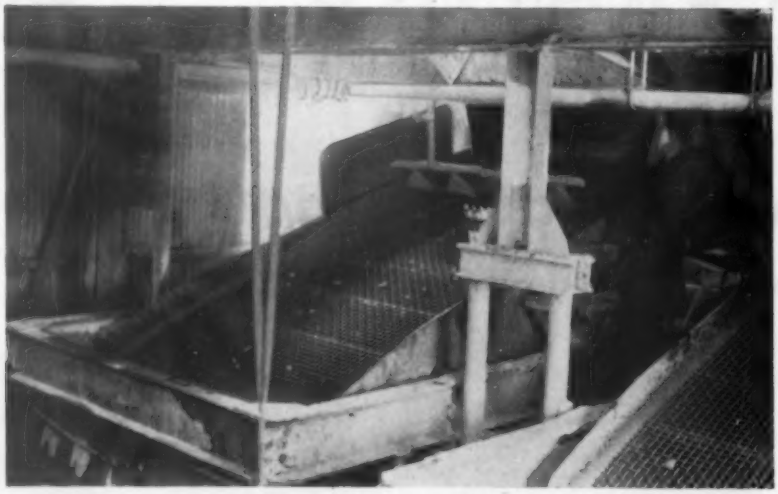


Fig. 2: Very large (8- x 11-ft.) vibrating screens for sizing commercial stone are a feature of this plant, Inland Lime & Stone Co.

trap rocks and granites, but there is not much demand except for concrete highways, and most of the highways there are surfaced with locally processed sand and gravel. They are generally stabilized with calcium chloride or asphalt, and they make fine transportation for a country where the chief industry, aside from mining, is catering to Summer visitors.

Fig. 3: An unusual but effective method of stockpiling huge quantities of finished product is necessary because of the nature of shipping facilities—lake carriers which may be detained by storms, etc.

Geology

The general geology of the State of Michigan is not difficult to grasp, particularly that of the Southern Peninsula. It is, to all practical purposes, a shallow basin containing deposits from Cambrian to Permian origin, and by following outcrops around the rim, the same order in geological strata may be found. Gypsum, for example, is found in drill holes all over "the Michigan basin" at depths of less than 1500 ft. It outcrops in Iosco county, near the north side of Saginaw Bay, and is obtained in open-cut mines at Alabaster by the U. S. Gypsum Co. and at National City by the National Gypsum Co. The same stratum of gypsum is mined 75 to 100 ft. below the surface at Grand Rapids, by the Certainteed Products Corp. and the Grand Rapids Plaster Co. It outcrops again a few miles southwest of Grand Rapids.

Fig. 4: American Aggregates Corporation plant at Oxford, Mich.

Michigan still ranks fifth among the States in the manufacture of portland cement. Most of the early plants depended on marl as a raw material. While well distributed over the State, marl deposits were shallow and soon exhausted. The central basin being devoid of limestones anywhere near the surface, the cement plants that survive have nearly all shifted to the use of limestones from the rim of the basin, or the by-products of limestone processing in the alkali industry. The fringes of the States where these limestone formations outcrop contain some of the most extensive deposits of relatively pure calcium carbonate that exist anywhere in the world. The fact that these deposits are also accessible to the Great Lakes waterways has resulted in the development of the largest quarrying operations in the world. The most important outcrops of high calcium limestone are near Escanaba, Manistique, on the Northern Peninsula; Petoskey, Cheboygan, Rogers City and Alpena, on the Southern Peninsula.

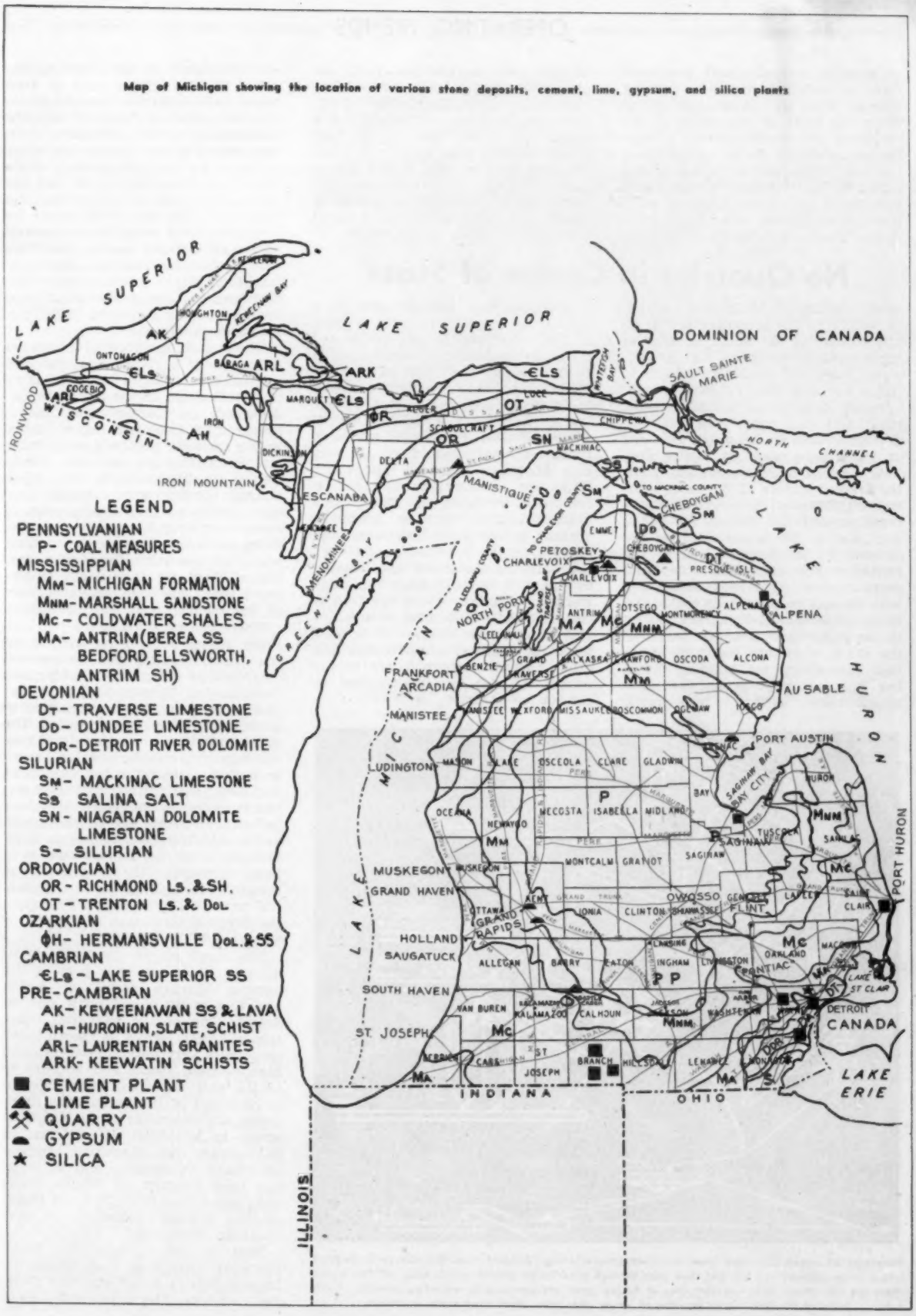
While these limestones are quarried and shipped on the Great Lakes in immense quantities, for all kinds of chemical and metallurgical purposes, they are also the most developed sources of dependable crushed stone aggregate. The limestones which outcrop in the southern part of the State near Jackson are of Mississippian formation and argillaceous. They are used for portland cement manufacture but can not be used to any very great extent for aggregates. The outcrops of dolomite which also occur around the rim of the Michigan basin, and especially on the Lake Michigan shore of the Northern Peninsula, are in some places quite pure, but some of those that have been quarried for aggregate in the Southern Peninsula have not met the State highway engineers' tests for high type concrete because of their argillaceous or impure nature. The metal magnesium is produced in Michigan, but it comes either from the salt brines, which underlie nearly all the central basin, or from the pure dolomites of northern Ohio.

The lime industry used to be more important in Michigan than it is today. Once there were several small plants on the high calcium limestone outcrops, but with the development of the huge quarry operations on the water front, the limestone was carried to industrial centers such as Buffalo, Detroit, Chicago and Duluth to there be made into lime, for lime suffers from the handicap of being a perishable product.

The impure limestones and dolomites supply excellent raw material for rock wool, and Michigan is a State with extremes of temperature,

(Continued on page 74)

Map of Michigan showing the location of various stone deposits, cement, lime, gypsum, and silica plants

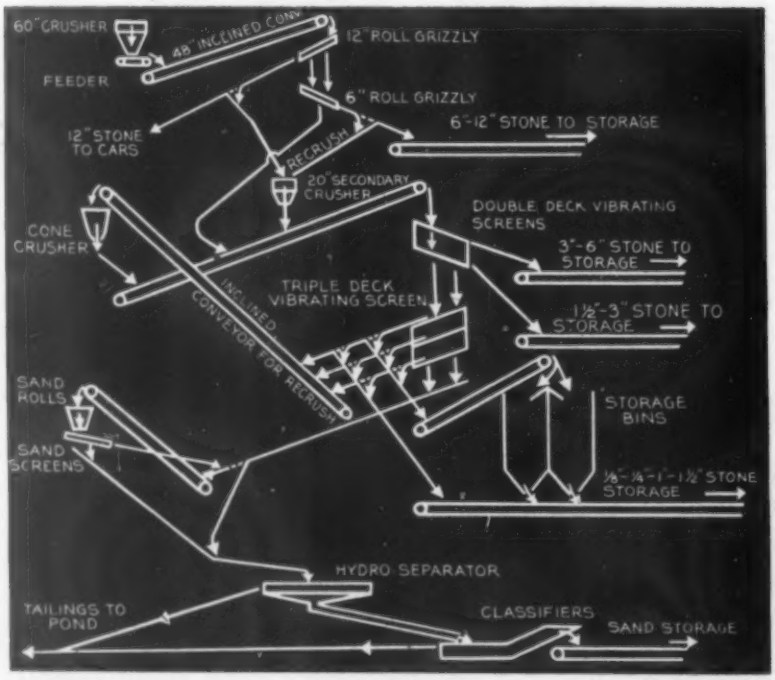


so already several small producers have established manufacturing plants. Also, the limestones of the State are quite as important as the extensive salt deposits in the manufacture of alkalis, for which the State has long been famous. Much of the limestone and dolomite which is not acceptable for State highway purposes, is made into agricultural limestone. The soils of Michigan, at least in the main agricultural part, are rather sandy and loose; hence, they require far more agricultural limestone than has ever been applied. The reputation of the State for its fruit is the result of both this sandy loam soil, and the fact that it lies east of Lake Michigan and west of Lake Huron, so that its normal climate is milder and more even than that of neighboring States to the south.

No Quarries in Center of State

THE "basin of Michigan," as explained in the preceding article on the geology of the State, is of Paleozoic and later origin—a shallow salt-water sea which gradually receded or dried up, and was eroded at later periods. Deposits of brine, gypsum, shale and sandstone were left, but few limestones or dolomites. Deposits of these were made at earlier geologic periods and are too far below the present surface of the basin to be utilized. However, they appear in outcrops around the rim of the basin, and that is where the quarries are located. In the western half of the Northern Peninsula there are outcrops of all kinds of rock, principally very ancient granites, trap rocks, and metamorphosed sedimentary rocks. In the basin itself, near the center of the State, sandstone was once quarried extensively for building stone, but it is not used as an aggregate except insofar as it gets into gravel.

Michigan and Pennsylvania have been close competitors for a number of years for the largest volume of crushed limestone produced annually. By far the greatest part of the 15,000,000 tons or so produced annually in Michigan goes to the steel industry in the Duluth, Chicago, Detroit, Cleveland and Pittsburgh areas. A relatively small part finds its way into Michigan highways and other structures as aggregate. One reason for this condition is that while crushed stone can be produced cheaply in very large operations, and shipped by the boatload at low cost, the crushing plants are not situated or equipped to make large rail shipments, and in any event the freight costs prevent employment of much of this stone in the interior. It is used for State highway construction and other purposes, where it can be received by boat and transported to the job by trucks.



Flowsheet of Inland Lime and Stone Co., Manistique, Mich. Product from the quarry is dumped into a large primary crusher and then goes through a series of grizzlys which scalp off the larger stone for flux stone. Other smaller sizes of fluxing stone are screened by vibrating screens. Flexibility of the flow allows crushing of larger sizes when more road stone is desired

Development of the limestone deposits of Michigan is said to have begun with its first settlement by the French. Lime was made for the first buildings at Detroit. For many years lime manufacture was an important industry, for the greater part of the State was forest and wood fuel was cheap. The loss of this cheap fuel supply and the ease with which the limestone itself could be transported to market centers, has left the State with few commercial lime plants. To take their places a large business has developed in the manufacture of alkalies and portland cement, which use the same limestones.

The map on the preceding page is a reduction of a colored geologic map published in 1936 by the Geological Survey Division of the Michigan Department of Conservation, R. A. Smith, State Geologist. It is published in two sections, Northern and Southern Peninsulas on separate sheets. Copies are still available for a small charge ($1.50), and certainly this map should be in the possession of every rock products operator in the State, and of any person who contemplates an operation there. Few geological maps are more easily understood than this one, largely because of the regularity of the formations.

There are six formations of limestone, which outcrop on the rim of the basin, suitable for commercial development. They are all older and underlie the Pennsylvanian formation, which contains no limestone or dolomite suitable for aggregates. The oldest limestone formation, the Trenton limestone (Ordovician) outcrops in Michigan chiefly in the vicinity of Escanaba, Rapid River and Trenary, and it underlies the glacial drift in a belt which extends across the eastern half of the Northern Peninsula from Menominee to the Neebish Islands in Lake Michigan. It is quarried at Escanaba for aggregate. In the central part of the Southern Peninsula the Trenton formation is 5000 ft. or more below the surface.

The next oldest limestone is of Silurian times and is a part of the famous Niagara formation which underlies many of our north central States. One of the Niagaran limestones, known locally as Fiborn limestone, is a very pure smooth-grained high calcium stone, and appears to be the only deposit of high calcium stone found in the magnesium limestones and dolomites of the Niagaran series in Michigan. It outcrops in Schoolcraft and Mackinac counties (Northern Peninsula) and it is or has been quarried at Fiborn, Henricks and Hunts Spur. It is not found at the surface anywhere in the Southern Peninsula.

Next in order come the lower Devonian limestones, Bass Island, St. Ignace, Detroit River, etc. The Dundee limestone (Devonian) is the most

famous, for it is on extensive outcrops of this formation, that the great quarries in Presque Isle county, including Rogers City, are located. It got its name, however, from Dundee in Monroe county, in the southeast corner of the State, where it was first quarried. It does not appear again on the eastern border of the State until you get to Presque Isle, where it underlies the Rogers City limestone. There is a belt of this limestone across the northern tip of the Southern Peninsula. Its high quality is well known, but it has been quarried only along the coast.

A younger Devonian limestone is known as the Traverse limestone because it outcrops along the shore of Little Traverse Bay in the northern part of the Southern Peninsula. It is generally separated from the older Dundee stone by what is known as the Bell shale. The Traverse limestone outcrops in a belt which includes Alpena, Cheboygan, Emmet and Charlevoix counties, and is quarried at Petoskey and Alpena. It is a good high calcium stone and is used extensively for cement, alkali and lime manufacture. In the Alpena region it contains beds of shale, but at Petoskey there is very little shale. There is a belt of this limestone in the southeastern part of the State, but it lies buried under glacial drift.

The latest deposit of limestone of commercial importance is the Bayport of the Mississippian formation. It is quarried or has been near Bayport, Huron county, near Omer, Arenac county, in the Saginaw Bay country, and near Jackson in Jackson county in the south central part of the State. It supplies aggregates, cement raw material and agricultural limestone. In the north it is often cherty and with some magnesium. In Arenac county the Bayport limestone is used for the manufacture of rock wool.

Dolomites

There is a belt of Niagaran dolomite bordering the north shores of Lakes Michigan and Huron, extending from Delta county to Drummond Island, through Mackinac county. The Engadine dolomite, which is quarried at Ozark, between Manistique and St. Ignace, is very pure and is believed to have a great future in the metallurgical industries. The deposits of dolomite in the Northern Peninsula have not been exploited to any extent. An outcrop of dolomite occurs in the Southern Peninsula in the southeast corner, in Monroe and Wayne counties, but it is not pure enough for any other uses than aggregates and agricultural limestone.

The utilization of igneous rocks in the Northern Peninsula is overshadowed by the metal production of this locality. Nevertheless, there are numerous small quarries and crushing plants, particularly in Marquette county. The trap rocks of the upper peninsula make excellent aggregate for black-top road surfacing. Quartz has been quarried and ground for various purposes in Marquette county. Slate was formerly quarried in the upper peninsula in Baraga county.

The trap rock of the upper peninsula includes several varieties of stone. In Houghton, Keweenaw and Gogebic counties it is known as a amygdaloidal basalt which contains native copper. In the vicinity of Marquette, Ishpeming and Negaunee, the trap rock may be altered gabbro (called diorite), diabase or quartzite. These three cities have municipal quarries and crushing plants. There are also granite outcrops in Marquette county.

Fig. 5: Dredging operation for handling material that runs 75 percent gravel, with 25 percent of that over 1½-in. size, Andersen Sand and Gravel Co.

Good Sand, Not So Good Gravel

Much need for a practical device to eliminate "soft" stone

FEW STATES have as many sand and gravel deposits as Michigan, and in few States could producers make better use of devices to eliminate so-called "soft" stone or gravel. To those who have read the foregoing article on the geologic features of the State, the reason for this condition will be apparent. The whole central part of the State is well stocked with glacial drift, which contains many fine deposits of sand and gravel, but much of the gravel is made up of rocks of such recent origin — sandstones and shales — that gravel from relatively few commercial plants in the State is considered suitable aggregate for the highest type of State highway concrete pavements.

A State Geological Survey Report on the "Mineral Resources of Michigan" published in 1923, at the beginning of the boom in concrete highway construction, states: "The sand and gravel resources of the State are inexhaustible." At that time the State highway engineers had not had as much experience with them as they now have. Since then they have become more choosey and will accept the gravel of relatively few producers for concrete; either those fortunate enough to have out-of-the-ordinary raw material, or who have developed fairly satisfactory methods of eliminating the soft particles. The sands, while containing considerable silt and loam, in some instances, can be washed without much difficulty to meet State highway specifications.

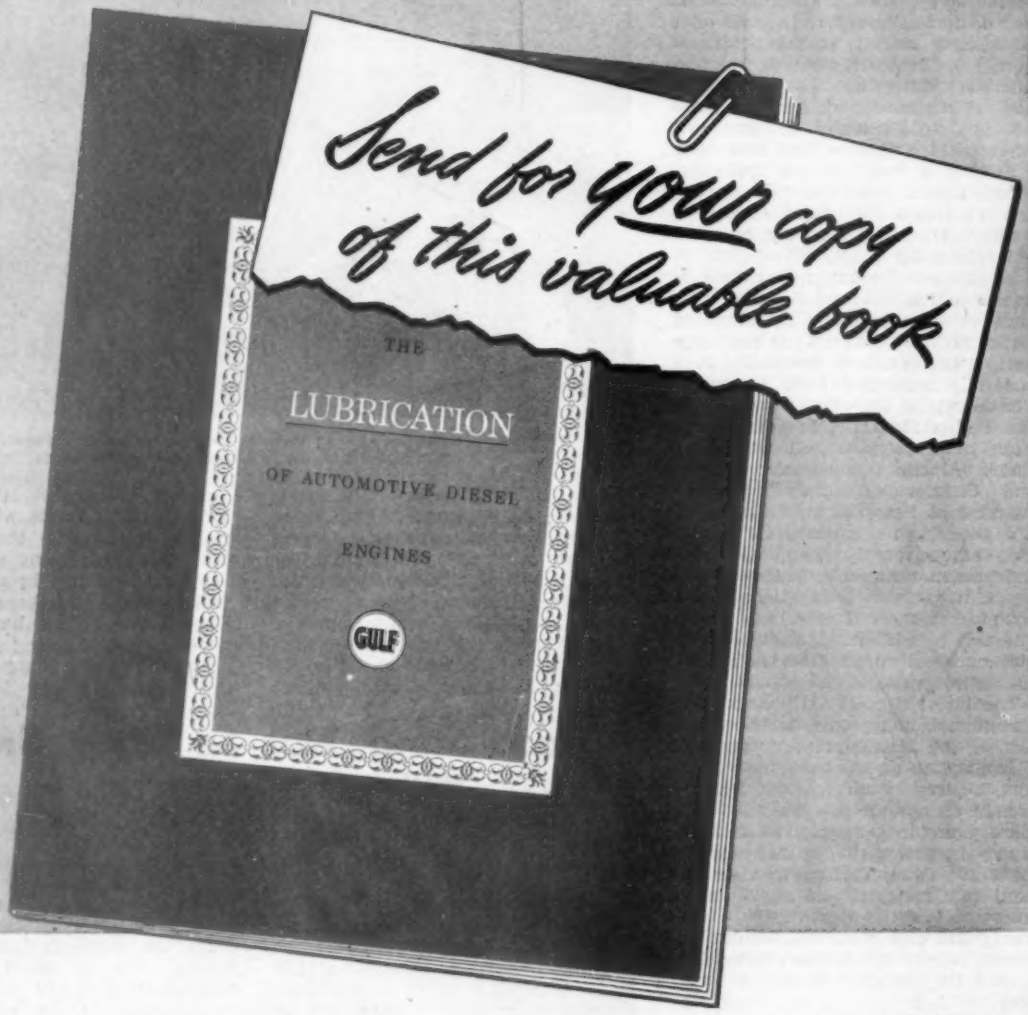
According to the report already quoted, the most important deposits of sand and gravel in the lower peninsula occur in ridges known as "hog backs" or eskers, in irregular hills called kanes, in outwash plains, deltas, and beach ridges—features resulting from water action during the retreat of the last glacier. This explains why the best gravels are near the southeastern, southern and southwestern parts of the State, for here are the gravels on which the flowing water and weather had the most opportunity to work.

Again quoting from this report: "The composition of gravel varies greatly in different parts of the State. In localities where the glacial drift is thin, the gravel generally contains a considerable, or even a large percentage of pebbles derived from the underlying rocks. Where the drift is thick the gravel is composed chiefly of pebbles which have been carried

(Continued on page 79)

Memo to operators of

Automotive-type Diesel engines:



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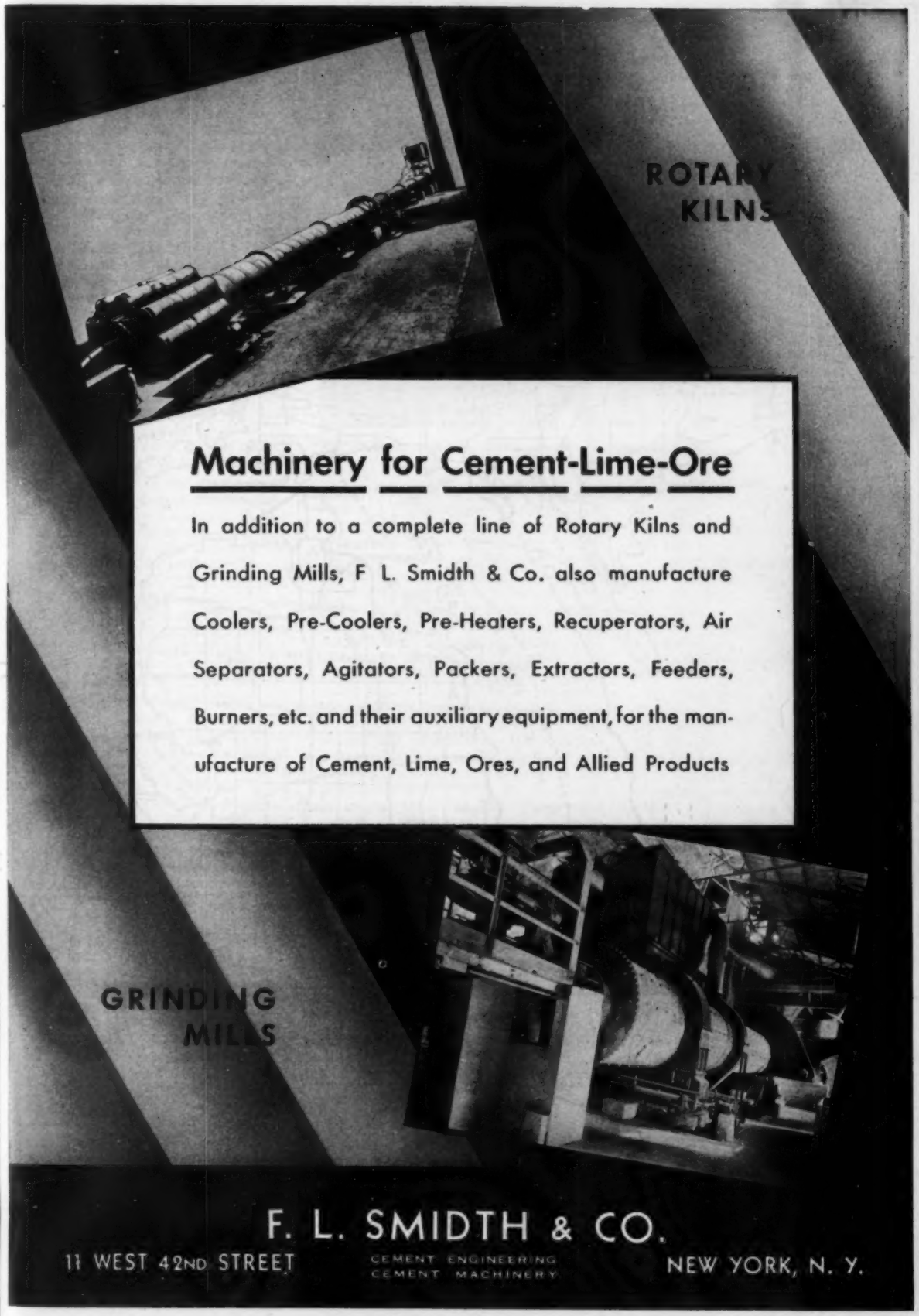
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Map of Michigan showing location of sand and gravel plants with relation to the primary highways of the State

considerable distances by ice and water; hence the pebbles are usually harder and more resistant rock material. In the limestone regions of Presque Isle and Alpena counties there is a broad belt of gravel ridges along the shore of Lake Huron, but the gravel is composed chiefly of limestone pebbles largely derived from the underlying beds of limestone."

For the same reason the gravels in Jackson, Calhoun and Kalamazoo counties have considerable soft sandstone in them, from the underlying bed rock. On the other hand large deposits of gravel in the belt of limestone along the north shore of Lake Michigan and Lake Huron, while containing an abundance of limestone and dolomite pebbles, are very good gravels because these rocks are of more ancient origin and are hard and durable. Perhaps one could not find a better illustration of the necessity for knowing the geology of a locality before spending a great deal of money developing a sand and gravel deposit.

Naturally, most of the development of the sand and gravel industry has been in the lower peninsula in the vicinity of cities and industries. Some of these have only local markets, for the reasons described. Their material often looks all right and is accepted locally without question, and it is hard for these producers to understand why the State highway department will not accept it for concrete. It would be accepted if some way could be found to eliminate the excessive amount of soft pebbles.

The chief producing localities and counties are: Detroit and St. Clair rivers, and Kent county (the Grand Rapids locality), Washtenaw county (Ann Arbor and Detroit markets), Macomb county (Detroit market), Ingham county (Lansing and Jackson markets), Livingston county (Lansing, Jackson and Pontiac markets), Manistee, Oakland county (Detroit metropolitan market), Berrien county (St. Joseph and Dunes resort market), Jackson, Kalamazoo, and Calhoun counties (Battle Creek market).

The State Geological Survey made a special study but has not published a report on the sand and gravel resources of the State, although one of its most important non-metal mineral assets. There is, however, a very complete report on "Molding Sands of Michigan," published in 1936. This is one of the most comprehensive studies of foundry sands that we have ever seen. It contains much data on sands for other uses including construction. The most valuable part for studying the possibilities of these sand deposits is a table of sieve analyses of 309 samples of sand from all over the State. These are raw sands and presumably the samples were selected to see if they could be used as foundry sands. Moreover, the sieve sizes were Nos. 6, 12, 20, 30, 40, 50, etc. down to No. 270. These were nearly all finer sands than would be used for concrete, for most had less than 2 or 3 percent retained on a No. 6 sieve. By interpolating values for No. 16 half way between Nos. 12 and 30, we get some typical analyses of construction sands designated as follows:

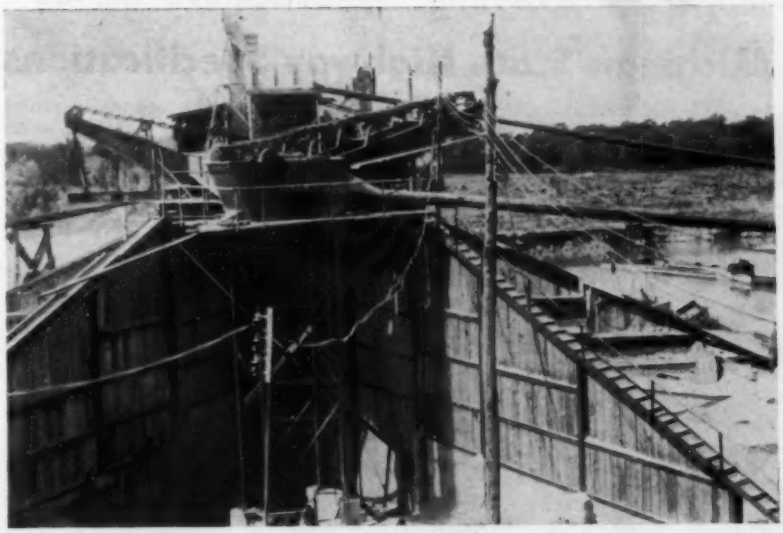


Fig. 6: Radial stockpiling system permits some weathering which probably helps reduce percentage of soft particles in gravel

TORPEDO (OAKLAND COUNTY)

	PASSING
No. 6	99.1 percent
No. 16	90.4 percent
No. 30	53.2 percent
No. 50	8.6 percent
No. 100	1.1 percent

BALLAST (OAKLAND COUNTY)

No. 6	89.0 percent
No. 16	71.0 percent
No. 30	13.0 percent
No. 50	2.3 percent
No. 100	1.3 percent

CONCRETE (MACOMB COUNTY)

No. 6	100 percent
No. 16	98.9 percent
No. 30	93.7 percent
No. 50	62.0 percent
No. 100	5.7 percent

If these are typical concrete sands, it is apparent that there is a wide range in particle-size distribution, as would be expected from the nature of their formation. Taking the tabulation as a whole, the great majority of samples passed the No. 6 sieve 100 percent; the maximum retained on No. 6 was the Oakland county ballast sand given in the foregoing tabulation, 11 percent. The percentages in the No. 30 to No. 50 show extremely wide variations. In fact, about all these analyses show is that Michigan has about all the varieties of sand sizes any one could want or expect. The primary problems are thorough washing to get rid of loam and organic matter, and recovery of minus No. 50 sand.

Stanton Walker, director of engineering, National Sand and Gravel Association, in his compilation of sieve analyses of samples of concrete sand from all parts of the country, has shown the Michigan sands to vary from 0 to 7 percent retained on No. 4; from 5 to 29 percent on No. 8; from 28 to 42.5 percent on No. 16; from 52.2 to 71 percent on No. 30; from 83.7 to 94.8 percent on the No. 50; and from 95 to 99.3 percent on the No. 100. The fineness moduli varied from 2.84 to 3.33.

Fig. 7: Grand Rapids Gravel Co., plant with ready mixed concrete unit to the left

Michigan State Highway Specifications

DESPITE its automobile industry, Michigan, so far as area is concerned, is primarily a rural and recreational State. Nearly all industry except mining is in the southern half of the lower peninsula. In other parts of the State more attention is paid to gravel and bituminous type highway than to portland cement concrete pavements. Hence, every effort has been made to utilize local materials to the best advantage.

Fig. 8: Consumers Gravel Co., Grand Rapids, screening and washing plant

The Michigan State Highway Department administers 9,400 miles of highways, the County Road Commissions, 83,372 miles and the cities 11,745 miles. The State mileage includes 8,370 miles in rural areas and 1,030 miles in urban areas. The Federal-aid system comprises 5,640 miles of the State trunk-line system.

Michigan's geological age is relatively young and the soil ranges from muck to ledge rock. The glacial deposits furnish many sources of sand and gravel for all types of highway surfacing.

There are about forty commercial aggregate producers furnishing materials for State highways and a large part of the contractors have portable crushing and screening plants which they operate in the hundreds of approved gravel pits throughout the state.

Subgrade Preparation

Michigan has recognized the need for a stable subgrade for several years and the Standard Specifications provide for excavating muck and frost heave material. Frost heave material is excavated to a depth of 3 ft. below the subgrade elevation, north of Township 12 North and to a depth of 2½ ft. below subgrade elevation, south of Township 12 North. Where frost heave material is excavated, the backfill consists of a sand-gravel material, all of which will pass through a 2½-in. square opening, with a maximum of 40 percent passing the No. 40 sieve and the loss by washing of the material is limited to a maximum of 10 percent by weight of the entire sample, unless otherwise authorized.

Where the subgrade does not provide a suitable foundation for the surfacing material, a sub-base of sand-gravel is placed, for a depth of 1.0 to 1.5 ft. under the road surfacing.

Porous Backfill, Grade A, is used for backfilling around structures and over underground drains. This backfill consists of a mixture of pebbles or broken stone and sand conforming to the following grading requirements:

Passing 2-in. sieve.....100 percent
Passing 1-in. sieve....60-100 percent
Passing No. 4 sieve... 0- 25 percent
Loss by Washing .....
.....not more than 10 percent

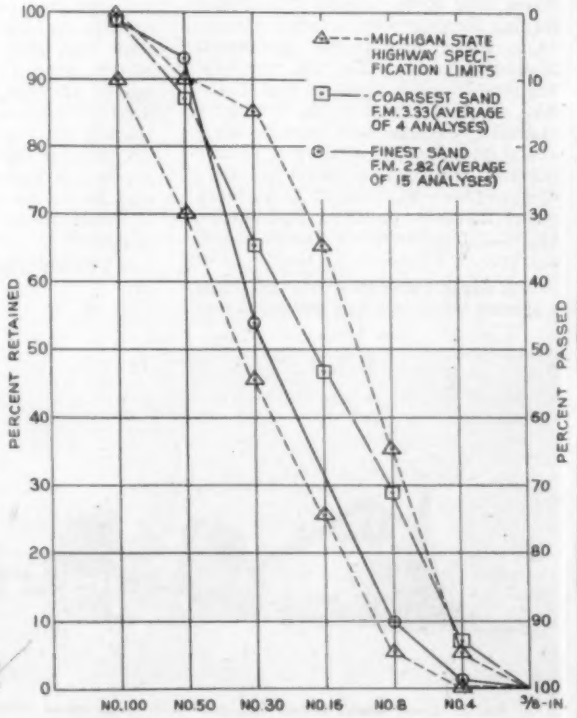
Fine Aggregates

Fine aggregate for portland cement concrete may be either natural sand or stone sand.

The fine aggregate shall be uniformly graded from coarse to fine and shall meet the following grading requirements:

Passing ⅜-in. sieve.....100 percent
Passing No. 4 sieve...95-100 percent
Passing No. 8 sieve...65- 95 percent
Passing No. 16 sieve..35- 75 percent
Passing No. 30 sieve..15- 55 percent
Passing No. 50 sieve..10- 30 percent
Passing No. 100 sieve. 0- 10 percent
Loss by Washing.....
.....not more than 3 percent

The above gradation represents the extreme limits which shall determine suitability for use from all sources of



Michigan State Highway specifications and examples of two sands

supply. The gradation from any one source shall be reasonably uniform and not subject to the extreme percentages of gradation specified above. For the purpose of determining the degree of uniformity, a fineness modulus determination will be made upon representative samples from any source. Fine aggregate from any one source having a variation in fineness modulus greater than 0.20 either way from the fineness modulus of the representative sample will be rejected.

The extreme grading limits show a fineness modulus of 2.35 to 3.80, but most sources of fine aggregate have a fineness modulus between 2.80 and 3.10.

Stone sand shall meet the same grading requirements as natural sand, except the loss by washing shall be not more than 4 percent. The stone sand shall be manufactured from stone meeting the physical requirements of coarse aggregate for paving.

Fine aggregate for white concrete shall be crushed white marble or white silica sand conforming to the requirements of Fine Aggregate, 2NS, as specified herein, except that it shall meet the following grading requirements, by weight:

Passing No. 4 sieve. 100 percent
Passing No. 16 sieve. 45- 85 percent
Passing No. 50 sieve. 10- 30 percent
Passing No. 100 sieve. 0- 10 percent
Loss by Washing....
.....not more than 4 percent

The gradation shall be varied between the limits specified above as directed by the Engineer, for workability of the concrete and to produce a smooth dense surface.

Other fine aggregates are specified for masonry sand and the various types of bituminous surfaces. The fine aggregate for bituminous surfacing is controlled within rather narrow limits. For example, fine aggregate for sheet asphalt binder and wearing course shall consist of clean, hard, durable sand, free from clay, loam and other foreign matter and shall meet the following grading requirements:

	Percent
Passing No. 4 sieve.....	100
Passing No. 4, retained on No. 10 sieve	0- 5
Passing No. 10, retained on No. 40 sieve	15-35
Passing No. 40, retained on No. 80 sieve	30-55
Passing No. 80, retained on No. 200 sieve	20-40
Passing No. 200 sieve.....	0- 5

The foregoing limits are intended to provide for such permissible variations as may be rendered necessary by the available sources of supply and the character of the work to be done. The grading of the sand may be varied within the limits above specified at the discretion of the Engineer, depending upon the kind of asphalt used and the traffic conditions upon the street or streets to be paved.

Where blending of sand is necessary, the different sands shall be stored separately and pre-blended to meet specification requirements and in accordance with instructions of the Engineer before feeding to the dryer.

Coarse Aggregates

Gravel, crushed stone and slag are used as aggregates in concrete pavement, bituminous surfaces and aggregate surfacing.

Coarse aggregate for concrete pavement is furnished in two sizes. One size is 1 in. to 2 in. and the other is 1 in. to 1½ in., and they are generally batched with equal weights of each size.

The Standard Specifications show a table of grading and physical requirements for the several classes of aggregates. Sampling and testing is done according to the A.A.S.H.O. Standard Methods of Tests for the requirements specified.

There are thirty-two different size gradations for coarse aggregate for various purposes, and the same number of requirements in physical characteristics or combinations of them, based on the American Association of State Highway Officials' methods of test for Deval abrasion, toughness, unit weight, soundness (5 cycles of magnesium sulphate test) and for soft particles. The requirements vary for aggregates for different types of construction. Those for coarse aggregate for concrete pavements, which must be furnished in two sizes, specify that gravel, crushed stone or slag meet the following tests: Loss in Deval abrasion test, maximum 12 percent for uncrushed gravel and 22 percent crushed gravel, crushed stone or crushed slag; soundness, maximum loss with any coarse aggregate 12 percent; loss by washing, maximum 0.8 percent for gravel, 1.0 percent for crushed stone; (1) soft particles, maximum 3 percent for gravel or crushed stone; (2) chert in gravel, maximum 3 percent for 4A and 5 percent for 10AS, (3) hard absorbent particles, 5 percent; the sum total of (1), (2) and (3) maximum 10 percent for gravel, or 3 percent for crushed stone or crushed boulders.

Soft particles are defined as "shale, soft sandstone, ochre, iron-bearing clay, weathered schist, shells, floaters, partially disintegrated particles, cemented gravel and any other particles which are structurally weak, or which fail to meet the soundness test." Hard, absorbent particles are not defined, but refer probably to flint or other silica, which may be hard but sometimes causes pop-outs in concrete pavements. The list of bad ingredients found in Michigan gravels is ample proof of their recent glacial origin, and the need for some practical methods for removing them.

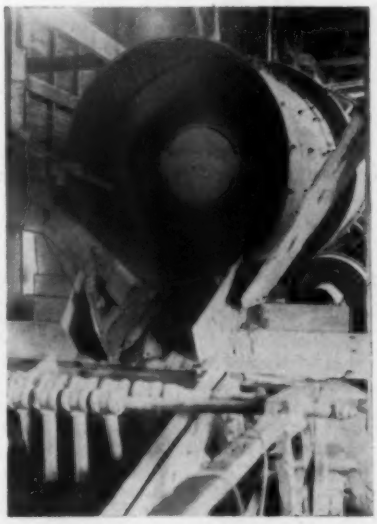


Fig. 9: Original Allswede scrubber and soft-stone eliminator at Hersey Sand and Gravel Co., Hersey

One large producer uses a combination cylindrical screen with large steel grinding balls for this purpose, apparently with considerable success.

Concrete

Concrete is designed according to the "Mortar Void Theory" and proportioned by weight, except for very small concrete pours, which may be proportioned by volume.

Ready-mixed concrete is used as well as concrete mixed at the site of the work. Concrete is required to be delivered to the forms in a satisfactory condition regardless of the method of mixing.

For the last three years, nearly all concrete pavements have used air-entrained concrete so as to reduce scaling due to the use of salts for ice removal during winter maintenance.

Concrete for pavements is designed for a minimum strength of 3500 psi at 28 days, and the approximate proportions by volume, dry loose measure, is 1:2¼:3¾ with 1.375 barrels of cement per cubic yard of concrete.

Concrete for structures consists of three grades and the plans indicate the parts of the structure where each grade of concrete is to be used. The approximate proportions by volume, dry loose measure, and the minimum compressive strengths are shown in the table below.

Grade of Concrete	Approximate Proportions	Cement Content, bbls. per cu. yd. of Concrete	Minimum Compressive Strength at 28 Days psi.
AA	1:2¼:3¼	1.50	4000
A	1:2½:3½	1.375	3500
B	1:2¾:3¾	1.25	3000

Structure concrete uses a somewhat smaller size aggregate, 1-in. or 1½-in. maximum size, than for pavement concrete which uses a 2-in. maximum size. Concrete for structures is placed with a slump of 2 to 5 in., depending

upon the thickness of the pour and the amount of reinforcing steel. The slump is limited to 2 in. when a vibrator is used.

Concrete for pavements is placed with a slump between 1½ and 2½ in.

The cement used meets the requirements for Type I Portland Cement, A.S.T.M. Designation: C 150, or Type III when high-early-strength concrete is required by specification.

Air-entrained concrete for pavements uses cement meeting the requirements for Type IA, Air-Entraining Portland Cement for Concrete Pavements, A.S.T.M. Designation: C 175-44T or Type I, A.S.T.M. Designation C 150, with the addition of an air-entraining admixture of Vinsol Resin, Darex or Orvus. The proportions for each project are determined by the State Highway Laboratory so that the cement content is the same as for plain concrete and the reduction in weight per cubic foot of concrete is limited between 3 and 6 pounds.

Typical Michigan Aggregates Plants

FOR THE TIME being, at least, we shall have to confine our discussion of the economic geology, or rock products industries of Michigan, to its aggregate industry. The cement, lime, gypsum and industrial silica operations here do not differ essentially from those in other states, except insofar as gypsum may be recovered from surface operations instead of underground mining, as is the general rule elsewhere.

The crushed stone industry in Michigan is confined largely to a very few huge operations—among the greatest limestone quarries in the world. Aggregates are byproducts with most of these crushing plants, the chief products being stone for metallurgical and chemical industries, and agricultural limestone. The Michigan Limestone and Chemical Co., subsidiary of the United States Steel Corp., the Inland Lime and Stone Co., subsidiary of the Inland Steel Co., Kelley Island Lime and Transport Co., Thunder Bay Quarry Co. are the four largest operators. Wallace Stone Co. and France Stone Co. have smaller operations for aggregate and agricultural limestone. In the northern or upper peninsula in addition to the Inland Lime and Stone Co. plant at Manistique are numerous small roadside quarries often operated by municipalities or counties for highway materials.

A brief description of the Inland Lime and Stone Co. plant will answer as an example of this kind of an operation where aggregate is chiefly a byproduct. The quarry operation is notable for its size and efficiency, particularly the drilling and blasting, which have received much study. After crushing and preliminary sizing to recover all the plus 1½-in. stone for other purposes, the minus 1½-in. tailings are sent to banks of vibrating screens for making four sizes of commercial aggregates from ⅛- to 1½-in. The fines, below ⅛-in. are sent directly to a 40-ft. diameter hydroseparator, or circuited through rolls for further reduction, and then sent to the hydroseparator for making a stone sand. The final dewatering is done by sand drags.

The American Aggregates Corp., Greenville, Ohio, operating two large plants in the Detroit area and one near Kalamazoo, is the most important factor in the sand and gravel industry in Michigan. These two plants at Oxford and Green Oak represent the outcome of several consolidations and are now two of the outstanding plants in the United States. Favored probably with better than average natural deposits of gravel, and through use of the Allswede scrubber and soft-stone eliminator at two plants and picking belts at all three, this producer is able to reduce the "deleterious" gravel pebbles to well within the state highway specification limits, already quoted.

The Allswede scrubber has been described many times. It consists of a 5-ft. diameter by 20-ft. long cylinder, within which are three concentric cones with perforated round-hole screens. The cylinder is revolved at 11 r.p.m. on an axis having a pitch of 1¼ in. per ft. The cones each separate out a size of gravel and the space in the cylinder between the cones is loaded with steel balls, from 3-in. diameter down, which are intended to be used to break down the soft particles in each size. This material is separated out and wasted. This device appears to be the only one used continuously over a period of years in this part of the country as a soft-stone eliminator with apparent success.

Fig. 10: Sablain sand and gravel plant, Lansing, made up chiefly of portable units

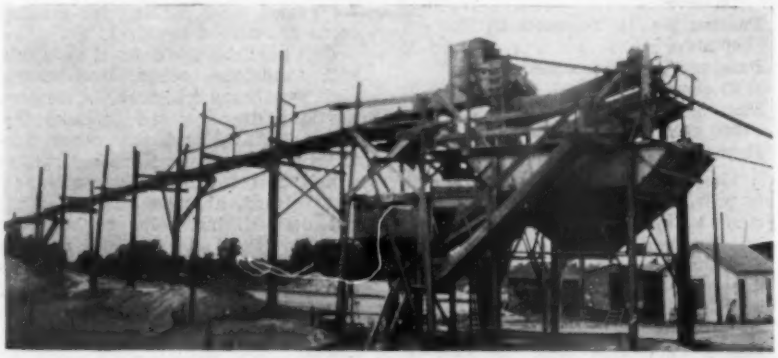


Fig. 11: Bolchot plant at Lansing is typical of many of Michigan's small pumping plants

Fig. 13: General view of new plant of the Kurtz Sand and Gravel Co., Flint. Arrow points to pump discharge receiver

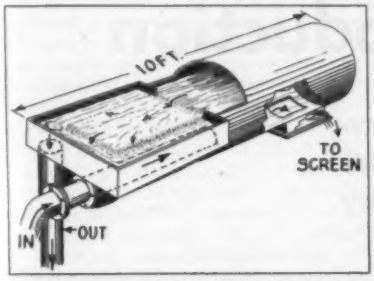


Fig. 12: Details of pump discharge receiver at Kurtz Sand and Gravel Co., Flint

The principal other feature of the Oxford and Green Oak plants is the "possum belly" sand recovery tanks, which by use of cone collectors in the bottoms of large shallow, rectangular tanks, permit recovering sands of various sizes. These may later be blended in any desired proportions. This method of sand recovery is becoming a feature of all the American Aggregate Corp. plants and has been described in ROCK PRODUCTS and by Fred D. Coppock, president of the company, at the conventions of the National Sand and Gravel Association.

Interior Plants

A more typical sand and gravel operation in the "Michigan Basin" is that of the Andersen Sand and Gravel Co. at Saginaw. This, like nearly all the other interior plants, is a pumping operation, although some 75 percent of the deposit is gravel, and 25 percent of that is larger than 1½-in. The pump discharge is fed to rotary screen and scrubber through a feed box. This screen separates out the sand and the finished size gravel. The oversize goes to one of two Symons cone crushers, in closed circuit with a Simplicity vibrating screen. The finished sizes go back to the feed box and thence to the rotary screen and scrubber.

The fact that such a large percentage of gravel has to go through the crushers, and twice through the scrubber, is apparently depended upon to keep down the amount of soft and deleterious particles in the gravel. Another feature which helps is the use of the Kern system of radial, outdoor storage. This permits a certain amount of weathering before shipment, which is one of the most effective methods of getting rid of soft particles.

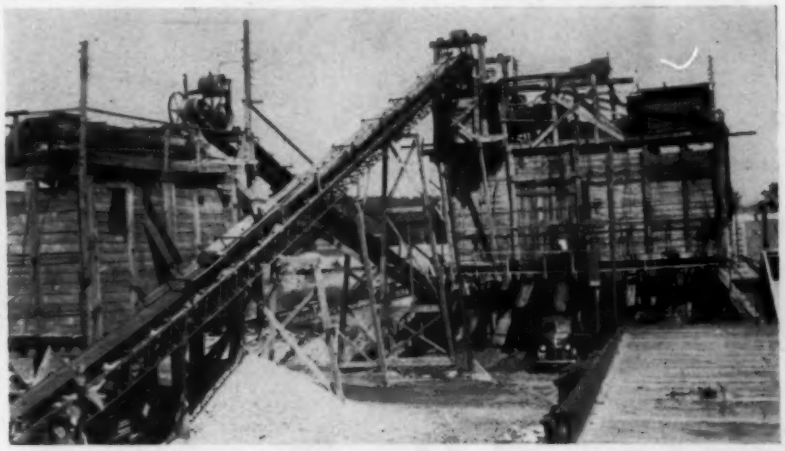


Fig. 14: No. 1 plant which uses vibrating screens and scrubber, Battle Creek Sand & Gravel Co.

Grand Rapids has two plants which are able to meet state highway specifications for concrete gravel, although most of their products are used for black-top pavements and ballast. Apparently these deposits are good enough so that no special attention is paid to soft particles. These plants are operated by the Consumers Gravel Co. and the Grand Rapids Gravel Co. There is nothing out of the ordinary in their sand recovery methods.

The Hersey Sand and Gravel Co. plant at Hersey is notable as the operation where the Allswede soft stone eliminator was developed and first tried out. It is still in use here, but the gravel product is sold only locally. A picking belt is also necessary to produce satisfactory gravel. Different sizes of sand are produced by screen openings in the bottom of a flume or launder.

There are two rather typical plants serving the Lansing territory—one operated by Ray Sablain and the other by the Boichot Sand and Gravel Co. The first is an assemblage of portable units, mostly Austin-Western, served by a Sauerman slackline cable excavator. The other is a small pumping operation, of which there are many. The Boichot plant puts the gravel through a log washer, which reduces some of the soft particles. The overflow is wasted.

A somewhat similar pumping operation is that of the Kurtz Sand and Gravel Co., Flint, which has a specially designed and homemade device for receiving the pump discharge shown in the accompanying sketch.

(Continued on page 91)

Fig. 15: Sand screws at left and gravel log-washer scrubber at right in No. 1 plant, Battle Creek Sand & Gravel Co.

Overall view of quarry and plant, to the right, above. Quarry floor is well-maintained to keep truck maintenance cost to a minimum

Speed Up Quarry Production

National Stone Co. cuts down quarry-to-plant haulage costs and adds more crushing and screening capacity

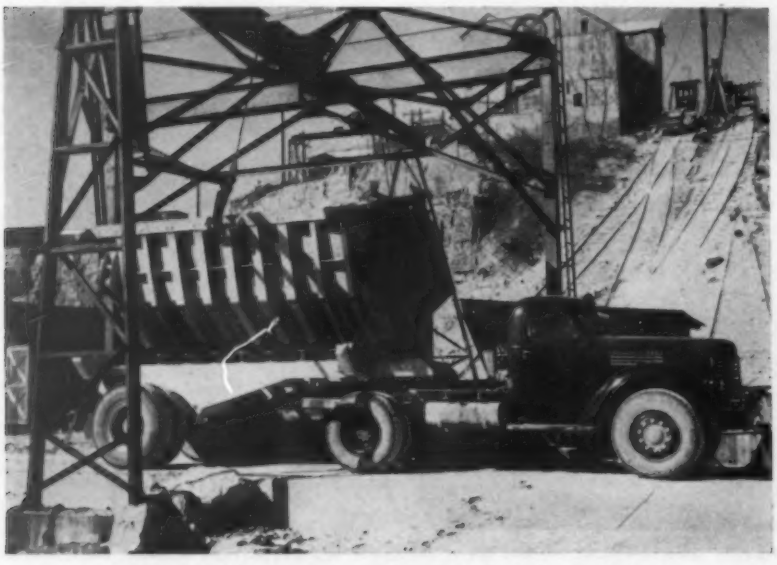
By H. E. SWANSON

"CONVENIENCE, efficiency, economy," was the three-word answer given by William Carter, president of the National Stone Co., Joliet, Ill., when asked for his reasons for changing over to truck quarry haulage.

In March, 1945, track haulage was abandoned in favor of trucks. Two 15-ton Easton TR-13 semi-trailers pulled by KR-11 International trucks now carry stone in the quarry, requiring two truck drivers in contrast to a gang of 10 to 12 men required to maintain and operate the track system. This is not only a saving in money but also in critical manpower. Maintenance costs have been measurably reduced. The floor of the quarry is quite level, a natural cleavage plane in the limestone formation having been utilized, which makes a smooth road for trucks to travel. Very little construction work was required to build these roads, and a negligible amount of maintenance is necessary to keep them in good condition.

With the system of track haulage previously used, it was necessary, of course, to take considerable time to lay track to the quarry face. This time has been reduced to a small fraction of the time required, since all that is needed now to get the location ready for haulage is about an hour's work with a bulldozer. Another advantage is that a shorter round trip has been made possible. With the former system the track had to be laid out in an elliptical pattern. The trucks take the shortest route on the pattern of roads in the quarry.

The two semi-trailers can make a little better than eight round trips per hour and together deliver about 280 tons per hour to the unloading platform. The round trip is slightly greater than ½ mile. The trucks which are gasoline engine-powered, use about 10 gal. of fuel per day. It has been found that the trucks are under full load only about 25 percent of the time since traveling empty and waiting to load and unload occupies the other 75 percent. The trailers are equipped with four 13.00 x 24 tires and the trucks have six 11.00 x 20 tires.



Dumping stone into hopper from which cars are hoisted to plant, above

Blasting Practices

The quarry lies adjacent to the corporate limits of Joliet, thus blasting is light. The 67- to 85-ft. face of seamed limestone is topped with a 3- to 17-ft. overburden of gravelly loam. The overburden is stripped by a No. 120B Bucyrus-Erie electric shovel with a 4-cu. yd. bucket, and is a valuable by-product since it can be sold as highway fill or for highway shoulders.

A single line of blast holes, spaced

at 12 ft. with an 18-ft. burden, is drilled the depth of the face by two Loomis Clippers and an Armstrong well drill. An average blast comprises three to five holes, which are drilled 6 in. uniform. The holes are charged with a 40 percent gelatin dynamite, six cases per hole, which yields about 1000 tons of stone per hole. As the stone breaks in rather large pieces, considerable secondary shooting is required. The calcium carbonate equivalent of the stone runs between 96 to 100 percent, ideal for agricultural limestone; a market which has been greatly increased in the past few years.

Trailers, which are loaded by the same shovel that strips overburden, travel over the well-maintained roads to the unloading platform. Here the stone is dumped into a hopper by an automatic hook-cable attachment, such as is shown in one of the illustrations. From the hopper, the stone drops to a 4- x 12-ft. Traylor apron feeder, which sends it to 8-ton cars over a standard-gauge track on a 30-deg. incline for delivery to the primary crusher at the plant. The feeder and the hook which dumps the trailer bodies are controlled by an operator in a small enclosed booth near the unloading platform. The cars, which are pulled up the incline by an Allis-Chalmers cable hoist, dump into the primary crusher.

New Plant Equipment

In 1944, new equipment was added to increase production and to promote greater flexibility. The new equipment includes four Barber-Green and Stanhope conveyors, a set of 54- x 24-in. Allis-Chalmers rolls, and a Seco, a Simplicity, and Link-Belt vibrating screens. The arrangement of equipment is such that stone can be sent to either of two plants. After primary crushing in a 36-in. Superior-McCully gyratory crusher, the stone is taken by an Allis-Chalmers bucket elevator to a grizzley with 1½-in. spacings. Oversize drops to a No. 8 Superior-McCully gyratory and the crusher throughs join the stone passing the grizzley for movement by belt conveyors to either plant. The cleaner stone is sent through plant No. 1 while the stone containing some wet materials is sent through plant No. 2.

With the present arrangement, 28 different sizes of stone can be produced. Bin capacity is about 1000 tons, utilizing 13 bins. Trucks or railroad cars can be loaded from bins or from stockpiles. The 28 sizes are contained in the combination of bins and stockpiles and demand for any of the sizes can be met at all times. About 50 percent of delivery is made by rail, 40 percent by truck, and 10 percent by barge on the Chicago Inland Waterway. The barges are loaded from trucks which take the stone from the plant to a loading platform on the nearby river.

Loading stone into haulage unit with 4-cu. yd. electric shovel. Note stone formation of quarry

The arrangement of conveyors, screens and crushers in both plants is such that any size of material can be sent to any crusher or screen, thus assuring a maximum amount of flexibility in operation. Addition of the new equipment has materially increased the screening facilities and promoted a more even flow on the screens, helping in producing a more uniform product. About 30 percent of present production is agstone, the balance being railroad ballast and road stone.

Left, Peter Pullara, hoist and feeder operator, and Fred W. Smith, general superintendent

Fred W. Smith is general superintendent of the National Stone Co., which has been in operation since 1904.

Dolomitic Masonry Limes and Mortars

G. J. FINK and EMIL TRATTNER, research associates for the National Lime Association, at the National Bureau of Standards, have prepared a report entitled, "Properties of Highly Hydrated Dolomitic Masonry Limes and Certain of Their Cement-Lime Mortars." This report presents the results of tests of the six commercially available masonry limes of a new type, the highly hydrated dolomitic limes. Masonry cements of 112 portland cement to lime ratio, and mortars of 1:2:9 ratio, were tested. The limes showed low expansion in the autoclave and high water retentivity; the mortars exhibited good workability and unusually high water retentivity.

Calcium Lignosulfonate

TESTS MADE by F. M. Ernsberger and Wesley G. France at Ohio State University, Columbus, Ohio, indicate that concrete will last much longer if the cement particles are dispersed with a suitable dispersing agent. The study involves in particular, calcium lignosulfonate, made from paper mill waste, and tests made on concrete made with dispersed cement have less porosity, greater strength and better wearing qualities than that made with plain cement. The results of these studies were published in *Industrial and Engineering Chemistry*, Vol. 37, p. 598, June, 1945, under the title "Portland Cement Dispersion by Adsorption of Calcium Lignosulfonate."

Protect Children

INSTITUTE OF MAKERS OF EXPLOSIVES, New York, N. Y., has sent out folders warning children and inexperienced persons from handling blasting caps and dynamite. Quite often children find blasting caps and proceed to play with them, causing some very distressing accidents. All users of explosives are urged to keep explosives and blasting caps in a secure place and promote publicity concerning the hazards of unauthorized handling of detonators, particularly among school children who may be maimed for life.

Catwalks have railings for safety. Head pulley and belt drives are covered, upper right

All the stairways have rails for safety. Housing at top covers conveyor belt drive to prevent contact with workmen except when making repairs

Close-up of housing covering belt drive. It will be noticed that gear outside of housing has metal plate cover

EXPERIENCE Keeps Down Accidents

Fort Worth Sand and Gravel Company, Quigley plant, one of the 1944 winners of ROCK PRODUCTS Safety Trophies

WINNING SAFETY AWARDS is no novelty at the Quigley plant of the Fort Worth Sand and Gravel Co. at Hurst, Texas. The most recent award is the ROCK PRODUCTS' trophy for plants working less than 100,000 man-hours for 1944 in the Bureau of Mines contest sponsored by the National Sand and Gravel Association. This plant also won ROCK PRODUCTS awards in 1933, 1934, 1938, 1939, 1940 and 1941. The 1944 award was based on 96,142 man-hours worked with no lost-time accidents.

Credit for the impressive safety record established at this plant is attributed to Ray Thomas, superintendent, and his assistant, E. E. Newman. Due to the untiring efforts of these two men, all employees have been made safety-conscious. A factor which has helped to maintain a good safety record is the fact that of the 40 to 50 men employed here, about 25 percent have been with the company since the plant was built, in 1928, and the average length of employment of all the men is about 10 years. Included in this group is D. V. Moon, foreman, who is also instrumental in helping to maintain a good safety record. Thus, with a group of veteran employees, the task of teaching safety precautions becomes easier. Aware, however, that familiarity sometimes is conducive to laxness, the superintendent and his assistants are constantly on the alert to prevent anyone from taking unnecessary chances. One or all of these men are always around the plant to see that the men are not endangering themselves by carelessness.

When a new employe is given a job, it is the practice to keep one of the veterans with him long enough to acquaint him with his job and to impress him with the fact that safety is one of the dominant features of the work. Not only are the men told about safety, but safety bulletins are placed in conspicuous spots as an added reminder that carelessness does not pay. Posters from the National Safety Council are put up in the offices, which are sure to catch the attention of all employees.

Use Safety Guards

While these educational precautions are important, much stress is

General view of plant showing wooden guards over belt conveyor and hand rails on catwalks and stairs. Housing in the background covers moving machinery

also placed on protecting the men by placing guards on all moving parts of machinery and equipment. The head pulleys on all conveyors are housed completely so that there is no chance of becoming entangled in them. Gears are housed or protected by screens and all stairways and catwalks are provided with hand rails. Platforms are also provided with railings and drive belts are either housed, or protected by railings, or are placed out of reach. Strict attention is paid to keeping the plant in repair. Inspections are made periodically to see that things are in good shape, and when repairs are necessary, one of the superintendents or the foreman is always on hand to supervize the work so that no unnecessary chances are taken by the workmen.

It has been through the excellent supervision and "safety-mindedness" of these three men that this plant has been able to establish such an excellent safety record. Installed in a prominent place in the office is a sign which reads: "This plant has run .... days without a lost time accident." All employees are proud to see that figure mount higher and higher.

Ready Mix Operations

(Continued from page 70)

A closed chute delivers the concrete to mixer trucks which are used only as agitators. The fleet of 30 transit mixers is composed of 2- and 3-cu. yd. Jaeger and Rex mixers. At the end of the day's operations, transit mixer drums are cleaned out into a sump provided for this purpose. When the drums begin to cake with hardened concrete, the Schramm air compressor with a chip hammer attachment readily removes the hardened material. Cleaning the mixer drums in this manner is only necessary about once every 60 days.

The central-mixed concrete plant was constructed in 1930 and has been serving Fort Worth and vicinity since that time. H. P. Bonner is president of the Fort Worth Sand and Gravel Co.; T. E. Popplewell is vice-president and general manager; and J. J. Randol is superintendent.

Agstone

(Continued from page 67)

tons an hour agstone capacity, only 200 connected horsepower will be needed. At present the New Holland crusheer has 80 hp. connected motor capacity, and is not using it to capacity.

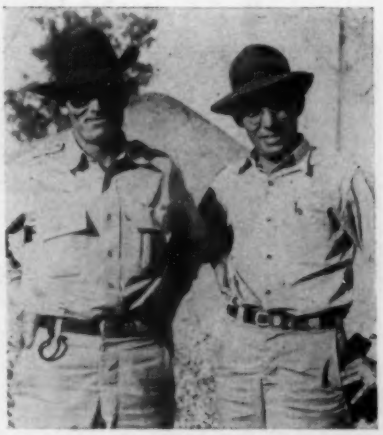
McCorkle Stone Company is a family partnership of Urso McCorkle, the father, and K. U. McCorkle, the son. Although Mr. Urso McCorkle is a veteran quarry operator, he takes an active part in the business.

Rebuild Block Factory

MARIETTA CONCRETE CORPORATION, Marietta, Ohio, will rebuild its Westview plant No. 2 at an expenditure of $100,000. A Besser Vibrapac machine will be added, and block will be made with Celocrete aggregate as well as sand and gravel. According to the report, the company will specialize on farm buildings. This company is one of the largest producers of concrete silo staves and constructors of concrete silos. The company also will make Flexicore floor and roof slabs.

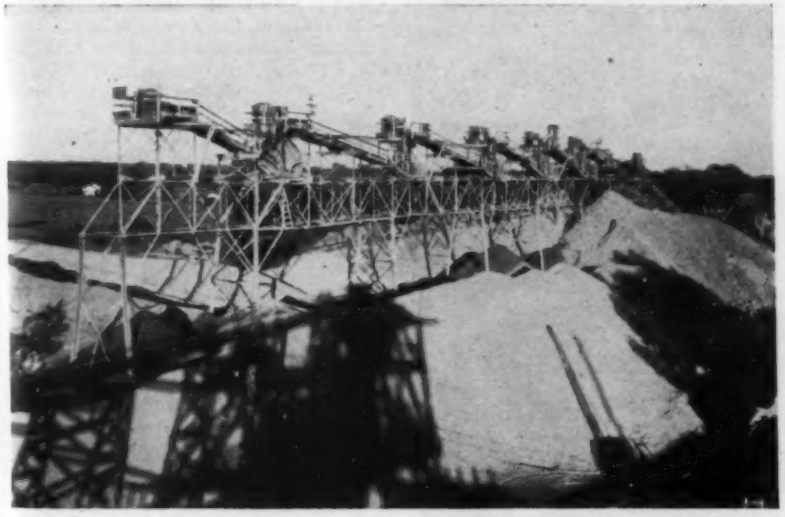
Purchase Products Plant

THE WAYNE CONCRETE PRODUCTS Co., Greenville, Ohio, has been purchased by Sargent Brothers, auctioneers and realtors. This company will continue to manufacture concrete masonry, drain tile, and other concrete products.



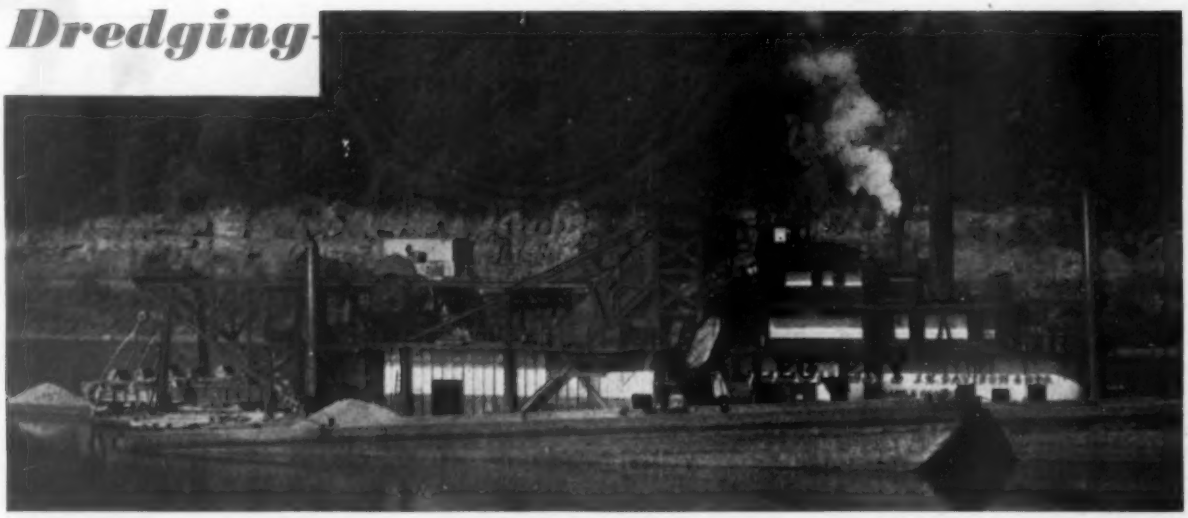
W. Ray Thomas, superintendent of Quigley plant, and E. E. Newman, assistant superintendent

D. V. Moon, foreman



Looking from stockpiling area to plant. Note housings on top of plant which cover head pulleys of belt conveyors at Quigley plant, Ft. Worth Sand and Gravel Co.

Housing covers belt conveyor drive to prevent accidents. Note head end of belt conveyor covered, to the right



Dredge boat, Allegheny, which has been completely modernized to increase capacity. Note how barge is being loaded

A Cleaner Product—More Capacity

J. K. Davison & Brothers, Pittsburgh, Penn., modernizes dredge by adding new vibrating screens and improved barge loading facilities

IN ANTICIPATION of large post-war demands for all sizes of aggregate, J. K. Davison & Bros., Pittsburgh, Penn., has modernized its large river dredge, the Allegheny, to increase production and at the same time realize cleaner size separations. Another problem involved meeting specifications 2, 2B and 3A of the Pennsylvania State Highway Department. This boat, which is one of the largest river dredges afloat, operates on the Allegheny river near Kittanning.

Before modernization, the bottleneck on the dredge was in the form of a pair of revolving, double-shell sifters having an overall diameter of 98 in. and a length of 34 ft. 6 in. They were operated in parallel just after the primary scalper. These units were particularly inefficient in producing 3A gravel, a great reduction in overall capacity being sacrificed to make only a passable product. These sifters were replaced by a pair of 6- x 12-ft., 3-deck, type F900 Ty-Rock vibrating screens, also operated in parallel. Where the old installations had 2½-in. and 1⅜-in. openings, the vibrating screens operate with 2½-in. and 1¼-in. openings. Even with the larger openings used on the sifters; viz., 1⅜-in., as compared to that of the vibrator; viz., 1¼-in., the end product of the former often contained too much of the minus 1½-in. sizes. Where it required from 10 to 12 hours to load a 500-ton barge of 3A gravel with the sifters, it now takes less than four hours using the vibrators, under similar feed conditions. This economy is reflected in the production of other sizes. Below is a comparison of the respective screening abilities of the two types discussed. The figures represent the average of many laboratory screen analyses made on production runs representing thousands of tons of output.

Screen Mesh	Revolving Sifters, Minus 2½ in., Plus 1⅜ in.	Vibrating Screens, Minus 2½ in., Plus 1¼ in.
Through 2½ in.	100 percent	100 percent
Through 2 in.	97 percent	85 percent
Through 1½ in.	75 percent*	25 to 30 percent
Through 1 in.	1 to 12 percent	2 percent

Digging ladder in operation

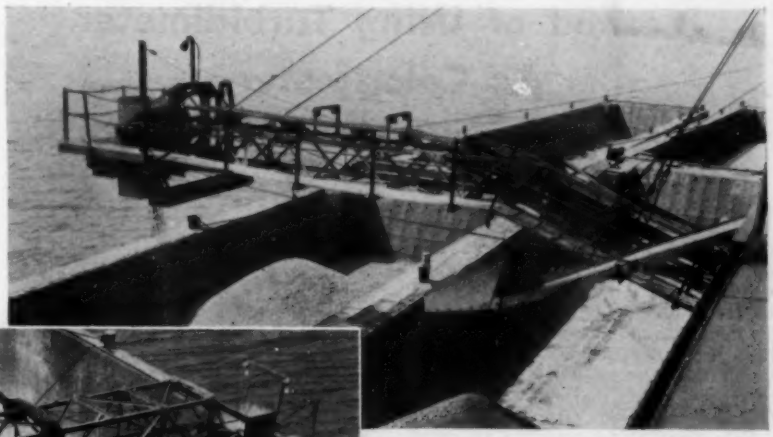
This self-contained floating gravel plant is capable of producing 800,000 tons per 8-month season. A description of the flowsheet follows: the digging ladder supported by a boom 52 ft. long, and consisting of special 17-in. pitch, pin link chain, to which 21-cu. ft. steel buckets are fastened, brings up the raw material from the river bottom into the screening and washing system. The buckets are spaced on 68-in. centers and are usually operated at a chain speed equivalent to 11 to 13 buckets per minute. The slack chain method of digging is used, with the limit of digging depth being about 60 ft. The great success experienced with this digger which consistently picks up better than a ton per bucket, is ascribed to the fine control the operator has over the digging rate. This change in pace is practical with the

*Note the poor separation ability of the revolving sifters at the 1½ in. size openings as shown by the laboratory test which showed 75 percent of the total sample to be smaller than 1½ in.

use of direct current motors, which, incidentally, are exclusively used throughout the dredge. Details of interest to operating men are the replaceable manganese steel rim-and-tooth sections of the bucket chain sprockets, and the replaceable manganese steel bucket lips.

Buckets discharge over a 4½- x 9-ft. type F800 Ty-Rock special vibrating scalper having 4- x 6-in. rectangular openings. The screening deck is a heavy perforated manganese steel casting fitted with skid bars. Oversize always returns to the river, but the undersize undergoes the first processing on the pair of 3-deck Ty-Rock vibrating screens described in connection with screening efficiency. The bottom cloth is usually of a 4-mesh opening, although 6-mesh cloth is sometimes used.

Top size from these screens: i.e., the 6- x 2½-in. is delivered to one of a pair of inclined rubber belt conveyors operated off of a common drive shaft. The 2½- x 1¼-in. size chutes to the other belt. They are both inclined 18 degrees to the horizontal which is about the limit of slope for carrying the larger rock. Chutes lined with .40-.50 carbon steel plate transfer these two sizes from the inclined belts to horizontal 24-in. belt conveyors delivering to barges on either side of the dredge boat. Dividing plates are so arranged that the two can be added to other sizes made later in the flowsheet, in any desired proportion.



Below: Loading two barges at the same time. Chute is used to discharge sand, and conveyor belt for loading gravel

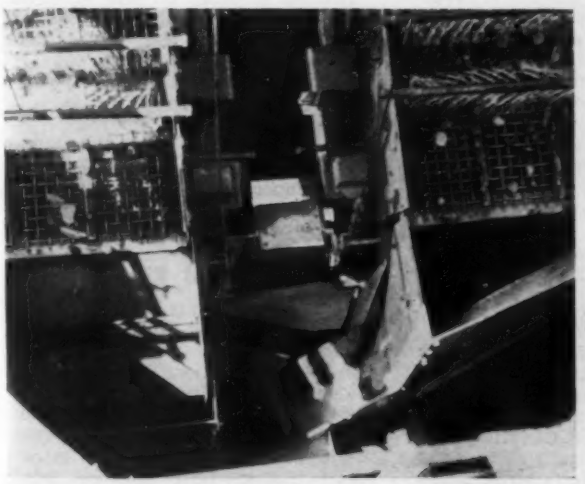
Above: Opposite side of dredge. Note that both belt conveyor and chute can be raised and lowered. Auxiliary chutes at end of conveyor belt and sand chute assist in distributing load

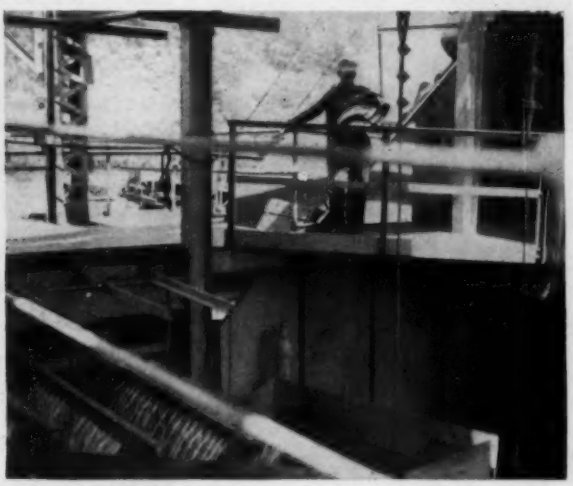
The 1½-in. x 4-mesh gravel is picked up by a bucket elevator equipped with 11-cu. ft. capacity steel buckets (manganese steel lips), which, moving at a rate of 13 buckets per minute elevate the charge 40 ft. to the top deck of a 5- x 10-ft., 3-deck, type F600 Ty-Rock vibrating screen, with cloth openings of ¾-in., ⅜-in., and 4-mesh, respectively.

The three sizes from this screen can either combine or discharge separately, to barges on either side of the dredge via steel lined chutes and rubber belt conveyors as described for the large sizes referred to earlier.

All of the belts loading the barges are furnished with hinged and swivelled chutes at the head end to

(Continued on page 111)





Left: Looking down at two 6- x 12-ft. vibrating screens. Note water sprays and rubber-lined chutes. Right: Dredge deck with sand elevator just behind man; spray pipes for vibrating screens in foreground

Chemist Corner

Method of Using Turbidimeter As Colorimeter

By ALBERT C. FOWLER*

IN the determination of the amount of Darex in portland cement, the color of the sample is compared visually against known standards unless a colorimeter is employed. This leads to error among different operators. To have a simple comparator we have been using our Burgess-Parr sulphur turbidimeter.

Procedure:

Set the galvanometer at zero through 50 ml. of distilled water at 78 deg. to 80 deg. F. Allow a half hour for the machine to come to equilibrium.

Prepare and distill the cement sample as per proposed A.S.T.M. method. Take 50 ml. of the second distillation and bring temperature to 78 deg. to 80 deg. F. Transfer 49 ml. to a glass stoppered volumetric flask, add 1 ml. of Nessler Reagent, shake and allow to stand for ten minutes. Transfer to the empty solution tube of the turbidimeter and *immediately* take the reading on the galvanometer. Refer to the chart on the *X* axis and read the percentage of Darex in a 5 gr. sample on the *Y* axis.

Temperatures must be maintained within the limits. Care must be taken that no NH_3 fumes come in contact with the sample.

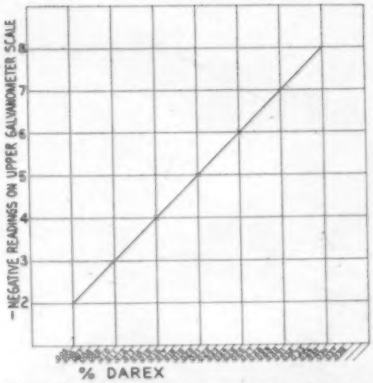
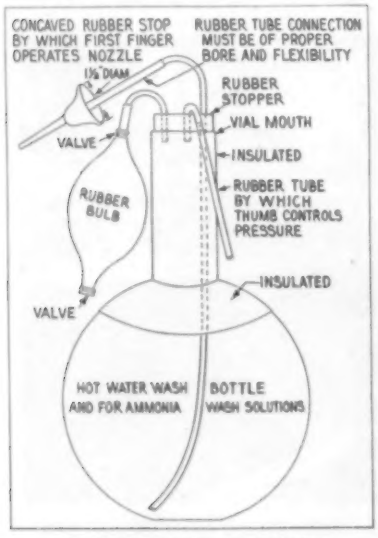


Chart for determining percentage of Darex required in portland cement sample

*Assistant Chief Chemist, Huron Portland Cement Co., Alpena, Mich.

Laboratory Wash Bottle

THE ACCOMPANYING SKETCH illustrates the principal features of a wash bottle developed by F. A. Lee, chief chemist, Gulf Portland Cement Co., Houston, Texas.



Details of laboratory wash bottle

According to Mr. Lee, this bottle can readily be assembled in any laboratory. Sheet cork is recommended for a good insulation. The concaved rubber stop, by which the first finger operates the nozzle, may be made from an old rubber bulb. The rubber tubing connecting the nozzle has a bore of ¼ in. with a ⅜-in. wall.

The necessary air pressure is obtained by the rubber bulb, with this wash bottle, instead of using the mouth for the purpose. In washing, the forefinger directs the stream as it would when using the ordinary wash bottle, but, in other wash bottles which make use of the rubber bulb for pressure, construction is such that the whole bottle must be moved in order to direct the stream.

Cement-Lime Mortars

G. J. FINK, in his research work for the National Lime Association, has prepared a report entitled, "The Effects of Certain Variations in Consistency and Curing Conditions on the Compressive Strengths of Cement-Lime Mortars." The conclusions of this report are as follows: Compressive strength data taken on a series of cement-lime-sand mortars showed that the 28-day strengths of 75 percent flow were higher than those of 110 percent flow. The reverse, however, was true from straight lime mortars. Different methods of curing were used. Curing for seven days in a damp closet, 18 days in water and three days in the laboratory air obtained higher strengths than 28 days in damp closets or 21 days in water.

Air-Entraining Materials

NATIONAL CRUSHED STONE ASSOCIATION quotes a discussion of air-entraining materials and methods of using them from the *Journal of the American Concrete Institute* for June, 1944, from tests conducted in the laboratory of the Portland Cement Association. Resins, natural and synthetic, animal and vegetable fats and derivatives, and various wetting agents, as well as trade name products, are examined. Methods of making the agent additions at different stages of cement and concrete making are criticized.

Concrete Standards

THIS MANUAL, published by A. S. T. M., July, 1945, covers test methods and specifications on concrete and concrete aggregates, reinforcements, preformed expansion joint fillers, etc. Light-weight aggregates are thoroughly covered, as well as ready mixed concrete. Sixteen test methods for concrete are given which include those for air content, compressive strength, flexural strength, flow, slump and volume change. Methods of sampling stone, sand, etc., and specifications for testing sieves makes the coverage complete.

Vinsol Resin Cements

NATIONAL BUREAU OF STANDARDS has published findings on the effect of heat on portland cement containing Vinsol resins. It was found that Vinsol resin carbonizes at 300° F. Heating cement containing the resin for 48 hr. at that temperature volatilized as much as ⅝ of the resin content. Heating takes place in the finish grinding of commercial cements and temperatures of over 250° F. may be found after many days of storage.

Testing Vinsol Resin

SIXTY-FOUR commercial portland cements containing Vinsol resin have been tested for tension and compression by the Bureau of Standards. Wider variations, using the compressive test, have shown up than when using the tensile test, indicating that the former disclose differences in cement which the latter does not. Furthermore, compressive tests are more reproducible.

Operating Trends

(Continued from page 83)

Fig. 12. It is a cylinder, approximately 10 ft. long and about 3 to 4 ft. in diameter, closed at one end. The current of the incoming pump discharge is therefore reversed in direction of flow which permits the gravel to separate out readily, while the sand is carried back over a settling tank with overflow to a gutter on three sides.

The Battle Creek Sand and Gravel Co., Battle Creek, operates two plants which are fed by shovel excavated raw material. The No. 1 plant uses an Eagle scrubber to improve its gravel output and a horizontal Symons vibrating screen for sizing gravel. The No. 2 plant is interesting in that a Diamond Iron Works portable crushing plant has been installed to supplement the older fixed plant. This plant has no sand recovery equipment, the wash water from the rotary sizing screen and scrubber with the sand is merely flumed to a hollow where the sand settles and the water runs off. Obviously it is rather difficult to recover a clean sand, although even this method fails to recover enough minus 50-mesh to meet the state highway specification for concrete sand.

There is one other large plant in Michigan which remains to be mentioned. This is the 1200-ton per hour plant of the Construction Aggregates Corp. at Ferrysburg on Lake Michigan. This is one of the largest plants of its kind in the world, and was designed to supply aggregates to industrial centers around the entire southern tip of Lake Michigan, including Chicago. It is a principal source of state highway aggregates in the southwest part of the lower peninsula. This plant is all-steel construction, including storage bins, which discharge to conveyors underneath. The method of unloading the scows which bring the material to the plant for processing is unique. The device, as shown in one of the accompanying illustrations, is a Ferris wheel unloader which discharges to the receiving belt at a considerable elevation above dock level.

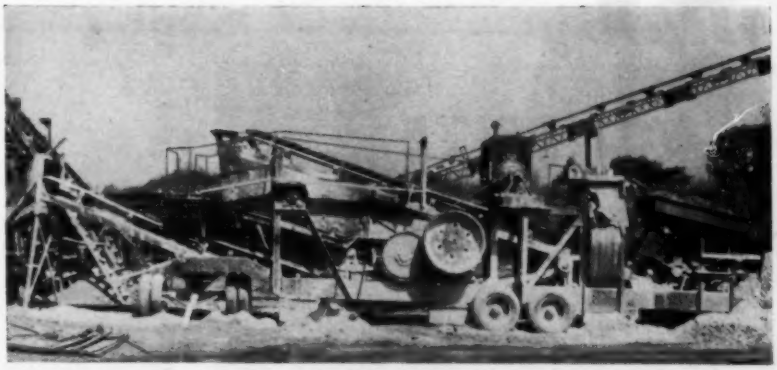


Fig. 16: No. 2 Portable crushing plant for gravel supplements No. 1 fixed plant

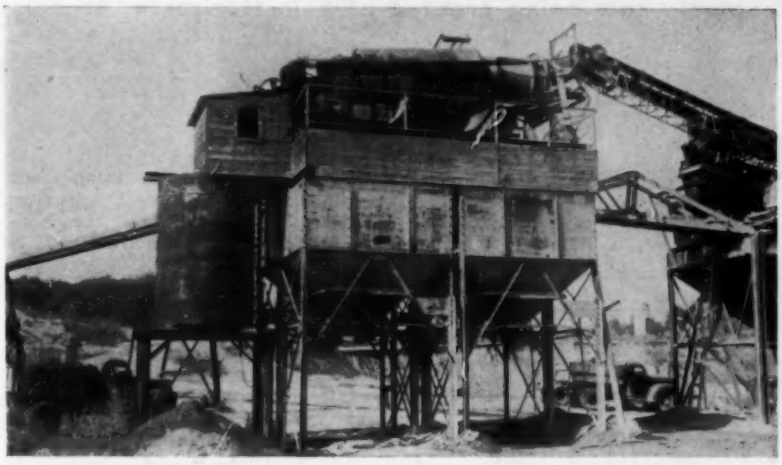


Fig. 17: Single rotary screen with jackets does sizing at No. 2 plant

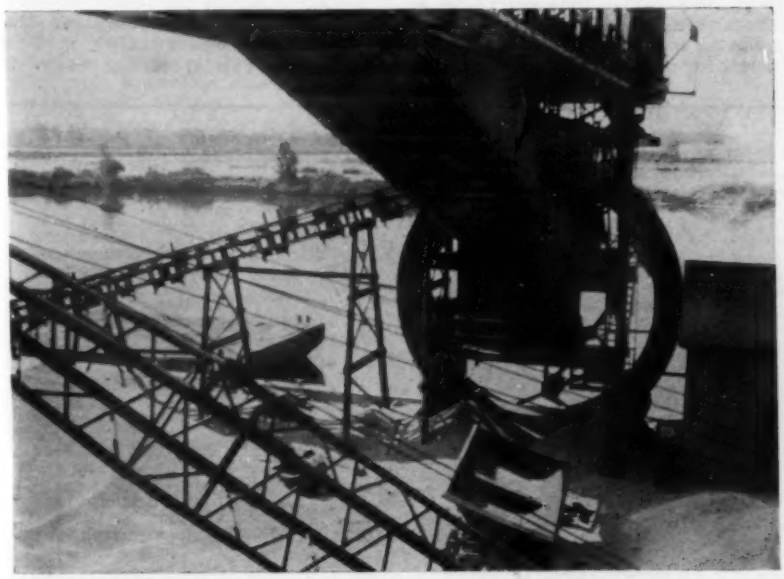


Fig. 18: Ferris wheel unloader for scows at Construction Aggregates Corporation plant, Ferrysburg

Boron

INCREASED domestic use of boron compounds in glass and fertilizers accounted for the highest boron mineral production since 1941, according to the Bureau of Mines. 1944 sales were 91,700 short tons in compounds valued at $6,579,587. Interest in boron fertilizers to prevent corky pit in apples, heart and crown rot in sugar beets, brown heart in turnips and swedes, cracked stems in celery, etc., is growing. Pacific Coast Borax Co. is expanding its plant for the production of kermite and tincal at Boron, Calif., in anticipation of increased postwar needs, which, besides the expanding uses mentioned above, includes the revival of enamelware making.

Move Gravel Plant

KILLINS GRAVEL CO., INC., Ann Arbor, Mich., having practically depleted its existing deposit, is planning to move the processing plant to a new location about four miles north of Ann Arbor. The plant will be moved this Fall and Winter to be ready to resume operations next Spring.

MAGNESITE
Brazil to Work Vast Deposits

Magnesita, S. A., is developing the largest deposit of magnesite in North or South America, and will also mine talc and recover precious stones. Processing plants now being erected at Belo Horizonte, Brazil

By J. A. Merz*

• This article was written in fulfillment of a promise to your contributing editor, Victor J. Azbe, last Fall when he visited the Magnesita, S. A., magnesite deposits in the State of Bahia, Brazil. The writer agreed to Mr. Azbe's suggestion to write a condensed report on these deposits and the importance to the economy of Brazil and the Western Hemisphere.—The Author.

IN 1939, a very large magnesite deposit was discovered in the vicinity of the small town of Brumado, State of Bahia, Brazil. The mountains, from which the deposit takes its name, are known as the Serra das Eguas which, translated into English, means the Mares Ridge.

Fig. 1: Map showing location of magnesite deposits in Brazil with relation to large cities and transportation

Most of the data in Table I was obtained through Victor J. Azbe from Oliver Bowles, Chief of the Nonmetal Economics Division of the U. S. Bureau of Mines, except for some figures taken from other sources, given in the footnote.

To present the relative importance of the world reserves of magnesite, the following tabulation (Table I) has been prepared:

Bulk of American Reserves in Brazil

A glance at Table I will show that the bulk of the world's reserves of magnesite is situated outside of the Western Hemisphere and that, on the other hand, by far the most important magnesite occurrence in North or South America is the Brazilian deposit in the State of Bahia.

If we consider that magnesite in modern technique meets a steadily growing application; be it as raw material for making sintered magnesite, the starting product for the magnesite brick manufacture; or to obtain caustic magnesia, used for the production of magnesia cement (Sorel cement), of the various magnesium salts and of metallic magnesium, my assertion that the magnesite deposits of Bahia may have a primary bearing on the economy of our Continents, may prove thoroughly justified.

From the map, Fig. 1, it will be noted that the region of the Serra da Eguas and the little town of Brumado are in the interior of the State of Bahia, connected with the State Capital, Sao Salvador, by a railroad of 650 km. length. Sao Salvador and, at a short distance, the smaller port of Sao Roque, are seaports for all minerals and other products exported from the Brumado district.

When the railway line, Brumado-Montes Claros, is completed in 1945, the magnesite deposits of Bahia will have attained direct railway communication with the three foremost industrial centers of Brazil; namely, Rio de Janeiro, Sao Paulo and Belo Horizonte.

The Magnesita S. A., exclusive concessionaire of the magnesite deposits of the Serra das Eugas, will build the first Azbe-vertical kiln in Brumado, designed to burn sintered magnesite. At the same time the company is constructing in Belo Horizonte, capital of the State of

Table I: The World's Reserves of Magnesite

AMERICA	
1) U. S. A.	
a) Stevens County, Washington	9.5 million short tons
b) Gabbs, Nevada	75.5 million short tons
c) Overton, Nevada	5 million short tons
d) California	70 million short tons
2) Canada	600,000 long tons
3) Venezuela, Island of Margarita	6 million metric tons
4) Brazil	
a) State of Ceará[3]	18 million metric tons
b) State of Bahia[3]	750 million metric tons
EUROPE	
1) Austria, Hungary and Czechoslovakia[3]	120 million metric tons
2) Greece[4]	5.5 million metric tons
3) Jugoslavia	6.3 million metric tons
AUSTRALIA	
Near Kalgoorly	1 million long tons
AFRICA	
Union of South Africa	260,000 long tons
ASIA	
1) U. S. S. R.	
a) Satka near Cheliabinsk	250 million metric tons
b) Biro-Bidzhan	1.2 million metric tons
c) Berdiausch	31.3 million metric tons
2) Manchuria	
Tashihkiao	5 billion metric tons

[1] Othon Meury Leonardos Megnesita no Brazil, Mineracao e Metalurgia, Vol. VII, Marco-Abril 1943.

[2] Otavio Barbosa Magnesita na Serra das Eguas, Bahia, Mineracao e Metalurgia, Vol. VII, Maio-Junho 1943, and researches made by Magnesita, S. A., Belo Horizonte.

[3] Raymond B. Ladoo Non-Metallic Minerals, McGraw-Hill Book Co., Inc., New York, N. Y., 1925.

[4] Dammer-Tietze Die nutzbaren Mineralien, Bd I, Verlag Euke, 1927.

*Technical Director, Magnesita, S. A., Belo Horizonte, Brazil.

Fig. 2: Characteristic occurrence of the ferriferous magnesite

Fig. 3: Formation of the saccharoidal magnesite

Minas Gerais, a modern refractories plant where, among other products, the sintered magnesite of Brumado will be worked into magnesite brick. As the State of Minas Gerais is the seat of a very important part of the Brazilian metallurgical industry, the choice of Belo Horizonte as the plant site for converting sintered magnesite into brick is self-explanatory.

Mineral Characteristics

The magnesite at Serra das Eguas occurs in four clearly determined varieties: as a very hard, coarsely crystalline mineral; white, red or gray-colored and ferriferous, extraordinarily suitable to be worked into dead burned magnesite. The remarkably beautiful shapes which erosion has given these rocks are shown in Fig. 2.

Iron oxide content varies in accordance with the coloration. Beginning with the white rock up to the greyish-black, the iron oxide content increases from 0.5 to a rather high degree. But the preponderant quantity of the material is flesh-colored, with iron oxide content of about 2% to 3%, and in regard of its other chemical composition it borders on the best known Austrian magnesites. It is this ferriferous variety which, in the Azbe-vertical kiln, will be burned into sintered magnesite. Calcining tests have proven highly satisfactory, and there will be no difficulty to obtain, by means of the right selection and adequate mixing, a product of constant chemical composition.

In Table II, below, will be found two typical analyses of the ferriferous magnesite variety, analysis A referring to the white, and analyses B to the red rock. The table also comprises, for the purpose of comparison, two typical analyses of Austrian magnesite from Veitsch and Radenthein.

The second magnesite variety, occurring in enormous quantities in the Serra das Eguas, is a snow-white, crystalline mineral of saccharoidal structure. Its iron oxide content is very low. Table II shows the analysis of the material under "E." The chemical composition is almost absolutely constant and the variation refers only to the hardness. It occurs in some deposits as very solid while in others so friable as to crumble in the hand. A typical deposit of this material is represented in Fig. 3. The variety is excellently suitable to be calcined in a rotary kiln.

The two described crystalline varieties make up the deposit of the magnesite in the Serra das Eguas. But there occurs as well, though in by far lesser quantity, a white, amorphous (compact) variety, very similar to the Greek and Jugoslavian magnesite, and with just the same behavior after calcining. The appearance of this magnesite variety may be compared, after calcining, with that of the Jugoslavian amorphous magnesite, in Figs. 4 and 5, and note

Table II: Composition of Crystalline Magnesites
(Proportion in per cent)

	Loss on ign.	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Total
Bahia							
A) White	51.56	.24	.60	.56	.10	46.74	99.80
B) Flesh	50.90	.30	.70	1.90	. . .	46.30	100.10
C) Veitsch[1]	50.41	.92	.10	4.06	1.68	42.43	99.60
D) Radenthein	50.50	2.46	.73	2.61	1.24	42.96	100.00
E) Bahia, White-saccharoidal	51.60	.42	.52	.26	. . .	47.00	99.70

[1] Dammer-Tietze Die nutzbaren Mineralien, Bd I, Verlag Euke, 1927.

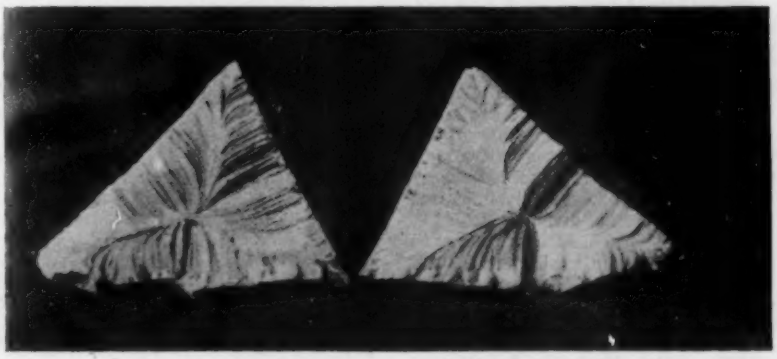


Fig. 4: Jugoslavian magnesite. Structure after calcination

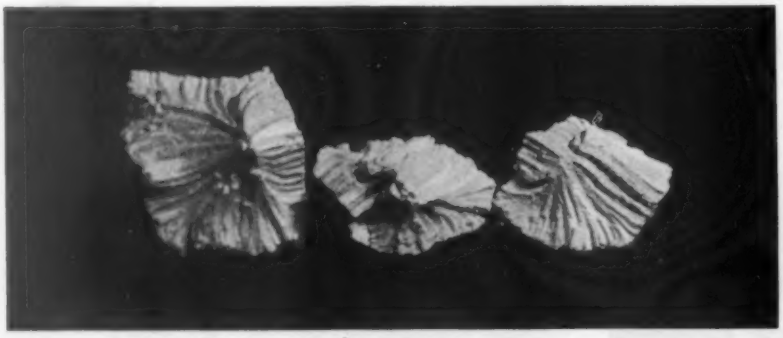


Fig. 5: Compact magnesite of Bahia. Characteristic appearance after calcination

in both cases the characteristic radiated appearance.

An analysis of the amorphous magnesite from the Serra das Eguas is given under A and B in Table III, the latter including as well for comparison a typical analysis of compact magnesite from the Greek Island of Euboea.

Table III: Composition of Amorphous (Compact) Magnesites
(Proportion in per cent)

	Loss on ign.	SiO_2	Al_2O_3, Fe_2O_3	CaO	MgO	Total
Bahia						
A)	51.53	.29	.48	. . .	47.50	99.80
B)	52.28	.28	.50	.47	46.48	100.01
Euboea[a] (Greece)	48.20	5.00	1.65	1.00	43.50	99.35

The extraordinary purity of the amorphous magnesite from Bahia, should be noted. Compact magnesites in most cases are contaminated by relatively high admixtures of SiO_2, occurring as remainders of the original rock (serpentine, olivine) or as opal, etc. As noted in Table III, the magnesite variety from the Serra das Eguas contains very little SiO_2 (.29%, .28%), distinguishing itself this way from the other magnesites shown in the table.

The fourth and last magnesite variety which occurs in the Serra das Eguas, is shown in Fig. 6. It consists of wonderfully crystallized, quite transparent rhombohedrons, but this form of magnesite is found only in tiny quantities.

Large Talc Deposits

The riches of the Serra da Eguas, nevertheless, are not confined to its magnesite. In the midst of the latter there are occurrences of talc in incredible abundance. It appears as a snow-white and soft material of very uniform chemical composition. Some typical analyses are given in Table IV.

The Magnesita S. A. is planning to install a Raymond roller mill, and this will enable the company to grind the material to the desired fineness of 320-mesh. There is no doubt that this talc will represent a precious by-product in the industrial exploitation of the magnesite from the Serra das Eguas.

To complete the information it may be mentioned that the inhabitants of Brumado, since ancient times, have excavated for emeralds in the Serra das Eguas and disclosed very large quantities of those bright-green little stones. The stone-searching continues into the present, and each time nice specimens are found. These precious stones occur only in small niches, deep within the deposits of the white, crystalline, saccharoidal variety of magnesite. When the magnesite deposits of the Serra das Eguas are exploited on a real big scale, there is also the prospect of a rich harvest of emeralds.

Table IV: Composition of Talc of the Serra das Eguas
(Proportion in per cent)

	Water of Constitution	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Total
A	4.50	62.38	.98	.30	..	31.79	99.95
B	4.10	63.50	.28	.16	..	31.86	99.90
C	4.43	62.34	..	.70	..	32.83	100.30

Fig. 6: Magnesite crystals of Bahia, Brazil

[a] Felix Singer, Magnesite Refractories, The British Clayworker, June, 1939.

Extracting Oil from Shale

A METHOD of extracting petroleum from oil-bearing shales, developed by Socony-Vacuum Oil Co., Inc., has been placed at the disposal of the United States Bureau of Mines. While the extraction costs are too high for present commercial operations in competition with crude oil, the method makes available to the nation, when necessary, an estimated 90 billion barrels of petroleum or more than four times its present estimated proved reserves.

Mining and crushing the shale probably will cost $2.20 a ton. With this process, between 17 and 40 gal. of oil are obtained from each ton of shale, depending on operating conditions and the raw material oil content.

Fluorspar in Kentucky

A STUDY has been completed by the Geological Survey of the Royal mine area, Livingston Co., Ky. Results of recent development work at this old mine have shown such promise that large scale geologic, topographic, mine and section, maps have been prepared to aid exploration for the fluorspar which is used for making 100-octane gasoline, and in the steel and aluminum industries.

New topographic and geologic maps have also been made of the Moore Hill system, Crittenden and Livingston Co., a highly productive region for many years, and the data have been released at the Geological Survey, Washington, D. C., and Rolla, Mo., for public inspection.

Economical Manufacture of QUALITY LIME

Part 4: Systems for controlled calcination and small stone burning

By VICTOR J. AZBE*

TO OBTAIN good quality and low cost lime there are certain fundamental requirements which need to be satisfied with any stone.

1) Proper combustion of fuel and steady supply of heat to the kiln.

2) Proper heat distribution in the kiln.

3) Uniform drawing of lime through the different shaft sections.

4) Complete cooling of the lime and recovery of the heat.

5) Temperature control of the hot zone by economical means.

6) Ample draft to obtain a high capacity.

7) Arrangements to facilitate operation.

Fig. 17 illustrates one of the smaller kilns, intended for large stone. Such kilns can be supplied with gas from a centrally located automatic gas producer or, as shown, from an integral producer located snugly against the kiln. Such producers make very good gas and have a gasification capacity ranging from 10 to 15 tons of coal a day.

The producers have water sealed ash pits, (1) have a rather thick fuel bed (2) which is conducive to the making of high CO gas and are under forced draft. No steam is used, clinkering is prevented by admixing some spent gas from the kiln (4) with the air.

Coal feeding is from a coal bunker through spouts into the hoppers (5) over the producer. This is done through manual operation of slides at proper intervals which, however, will soon be supplanted by mechanical means.

Centralized mechanical producers have their advantage in lower labor, but the soot blowing is a problem, as is also proper distribution of gas among several kilns. In the case of integral producers, soot from the center burner (6) is blown right back into the producer to be burned, and gas control is separate for each kiln by regulation of air to producer.

*Presented before the Canadian Institute of Mining and Metallurgical Engineers.

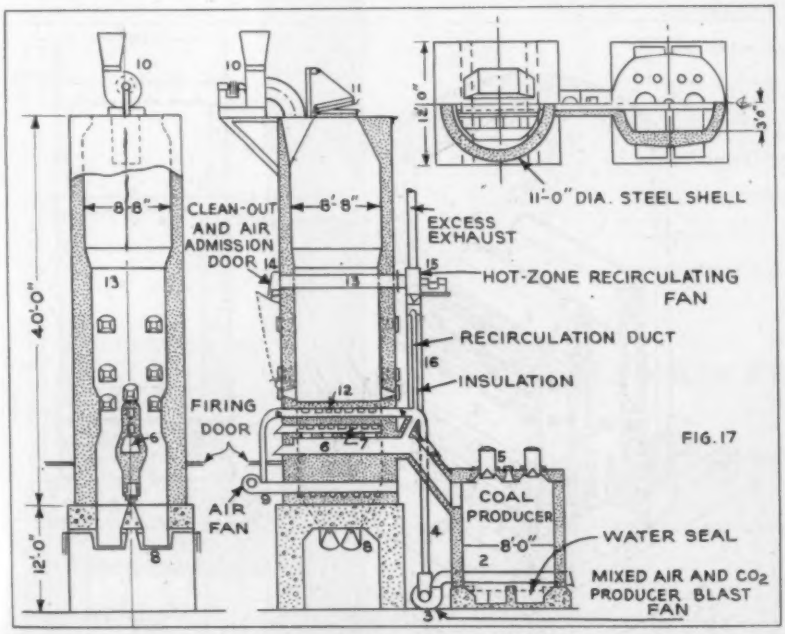


Fig. 17: Low cost 50-ton lime kiln of good efficiency. Kiln is arranged for complete temperature control by means of hot-zone recirculation, balanced draft operation and integral gas producer firing system with center burner

While in larger plants the mechanical producer still may be the answer, in small ones the integral producer is cheaper, better and more reliable.

The kiln as shown is suitable to both systems of gas supply. It will be noted that there are no side gas burners; all gas enters the kiln through the center burner in such manner that either more or less gas can be directed to any of the kiln sections, by the aid of the regulating slides, (7). (See illustration.)

Air for combustion can enter through the draw gates (8), or under forced draft from the air fan at (9). The kiln can be operated on the forced draft principle with the top wide open, or by induced draft through the aid of fan (10), in which case the stone charging door (11) remains closed. Air from air fan (9) can also be supplied to the secondary air duct of the center burner (12) for creation of turbulency in the hot zone, although ordinarily for this purpose recirculating gas from the hot zone recirculating system will be used.

The hot zone recirculating system consists of the stone submerged offtake pipe (12), the cooling door (12), the hot gas recirculating fan (13), the insulated recirculating duct (14) and the top duct of the center burner (12).

Hot Zone Recirculation

The idea of hot zone recirculation is to withdraw kiln gases from the end of the dissociation zone where they are too cool and reinject them where temperature is too hot, thus the upper section is heated and the lower section cooled, averaging out the temperatures and lengthening out the calcining zone.

An additional effect is that lime is burned as it should be, in a high volume, fast flowing stream of relatively cooler gases instead of a low volume, sluggishly flowing stream of very hot gases.

The large volume of recirculating gas tends also to create a turbulent state in the hot zone, reducing excess air, eliminating residual CO, equalizing temperatures and diminishing channeling and core.

The kiln is shaped and equipped with poke holes (15) for most convenient trimming of lime, and lime is drawn through four separate draw gates so that either more or less can be drawn from either corner of the kiln.

In the case of dolomite, the kiln will be somewhat different than for high calcium stone, but not much. Recirculation for one will be emphasized because dolomite demands low temperature, but the operating principle will remain the same.

However, when desired there may be a considerable departure from this

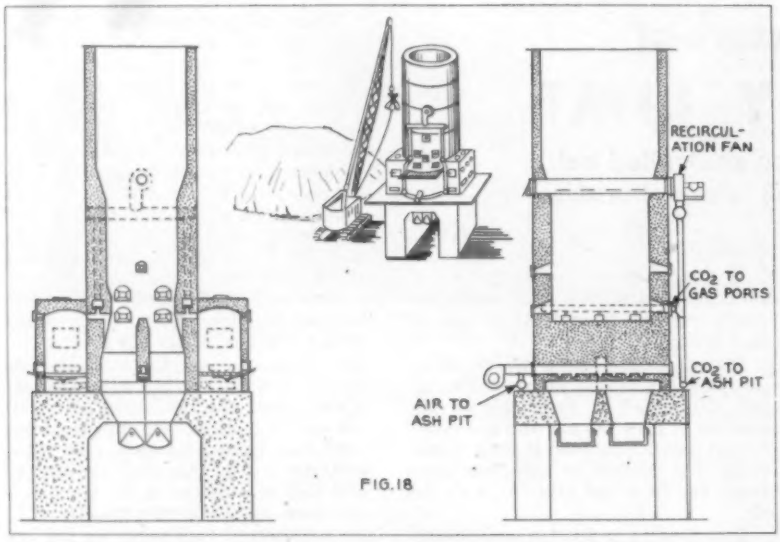


Fig. 18: Forced draft lime kiln with integral hand-fired producers and hot-zone recirculation

system, both downward toward simplification as well as upward towards greater perfection. When only a small production of lime is demanded, the kiln may be designed as shown in Fig. 18. This is a forced draft, semi-gas producer fired kiln with two fans involved. One is to force air into the cooler and producer and help out the natural draft. The other is for recirculation, to supply CO_2 to the producer for projection of gas into the kiln and hot zone tempering.

With such kilns, capacity will be about twice natural draft kiln capacity, and the fuel ratio will be much better, but neither capacity nor efficiency will be near that of the kiln shown in Fig. 17.

It would seem that reverting cooled gases to the hot zone would harmfully affect efficiency but that is not so and there is no reason for it. If we were injecting something from the outside to cool the hot zone, efficiency would suffer, but we are, as one could express it, merely stirring the hot zone. Then there is the practical fact that when recirculation is applied in this manner, fuel ratio is improved together with all the other advantages, including longer refractory life, not yet mentioned, but of great importance.

Calcination of Small Size Stone at High Capacity Rates

In the process of quarrying limestone for the burning of lime, particularly if it involves mechanical crushing, a considerable portion of the broken mass is of a size unsuitable for use in vertical kilns.

If there is a market for small stone as such, there is no great waste, but often the market is not able to absorb it, and in some cases as much as 35% of the spalls pass to the dump.

These waste heaps of small but good stone are in some cases very large, representing a great economic loss, which will tend to increase as most hand operated quarries are being converted to mechanical systems.

Frequently rotary kilns are installed for the burning of these small sizes, but rotaries are expensive, rather complicated, and also costly in fuel requirements. Small lime producers cannot afford them.

However, there was nothing else available because man has not mastered the subject of "Flow of Gases and Heat Transfer in Beds of Broken Solids." Many attempts have been made to burn spalls in vertical kilns, all relatively failures because in no case was the chain of requirements complete to do this successfully.

The writer dreamed and experimented about the matter for the past 25 years as the very first lime client he had quarried soft stone of pronounced spalling tendency, causing a great monetary loss, as well as a waste of a limited resource of the country's best, purest oolitic limestone.

But with small stone success cannot be partial, it must be complete or it constitutes a failure. Since there is no possibility of removing core from poorly burned small stone, any core in it condemns the entire draw to the dump.

But every new trial through all these years contributed some valuable link to the chain until it now has become strong and complete. It becomes apparent that this method of burning stone is preferable to burning small stone in rotary kilns and to burning large stone in vertical kilns.

In the rotary, there is no gas flow through the mass of calcining stone, the main stream of hot gases passing along the roof and the stone along the bottom; there is no general contact, no physical reason for the hottest gases to come down to the stone and it is a physical impossibility for them to flow through the solid mass. Most heat transfer is by radiation

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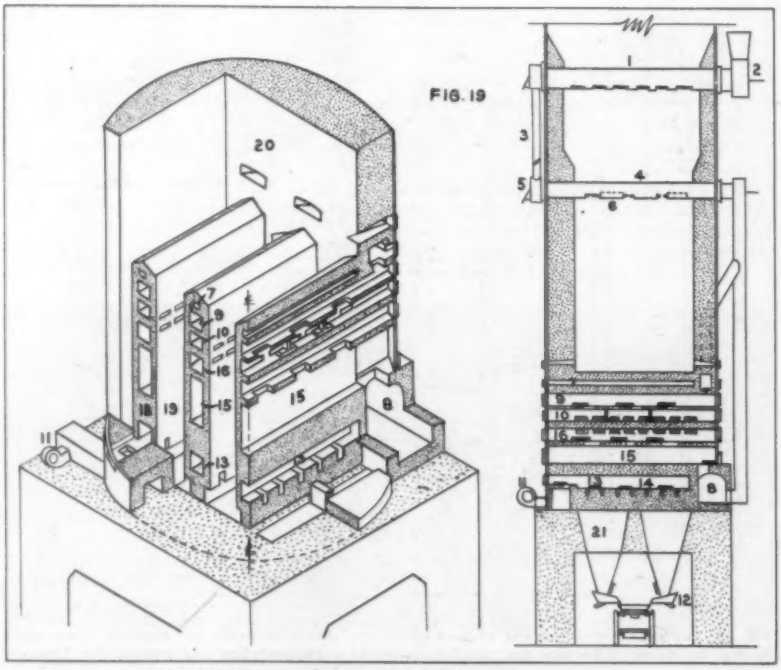

Fig. 19: Burner and control details of small-stone lime kiln

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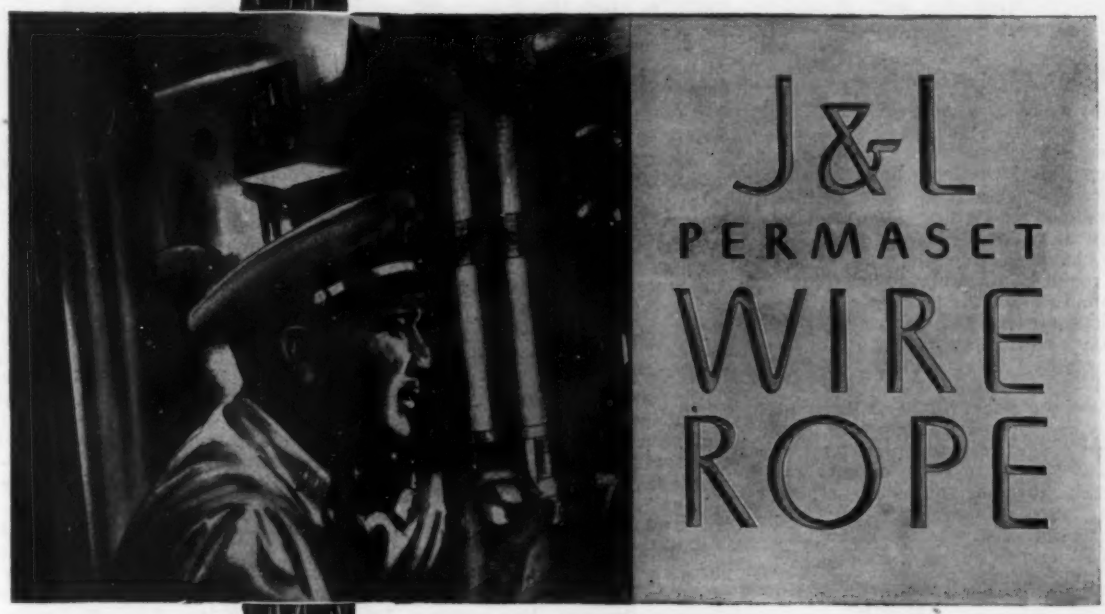

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demanding a high temperature to be effective. As a rotary kiln acts as sort of a classifier, the largest of the lime will repeatedly pass over the heat absorbing slope becoming in a manner flash burned, while the smallest will be shielded in the center of the mass, coming out of the kiln very likely in part unburned.

In the case of vertical kilns and large stone, the objection is that often the outside of a large lump is overburned before the inside has completed calcining. The smallest stone of the charge has to remain in the hot zone, likely four times as long as required, awaiting completion of the burning of the large stone. Even then there is often core, and when there is core a certain amount of recarbonation and occlusion of good lime occurs.

Both the rotary kiln with the small stone and the vertical kiln with large stone suffer from the high temperatures directly in heavy repairs and from impairment of lime quality. For most purposes only soft and uniformly burned lime is a good lime and neither one or the other type of kiln are fully capable of giving this.

Lime to be at its best should be burned at 2000 deg. F. or even less, when it is an entirely different product and when even relatively impure stone gives a relatively pure lime. But such low temperatures are unthinkable in the case of the rotary kiln, and would not be economical with large stone in the case of the vertical kilns.

However, high temperatures are not necessary if small stone receives its heat direct from hot gases flowing past it. Small stone calcines very quickly if it receives the heat, meaning that if the vertical kiln could be made to burn small stone successfully, the high temperatures would not be necessary and lime quality would be better than that with any other kiln. The problems covering this have been solved by patented designs.

As stone surface does the work and not kiln volume, a small kiln filled with small stone can be of much higher capacity than the largest large stone kilns in existence, provided the surface is made to work. And since 1½-in. stone has six times the surface of 8-in. stone, high temperatures are not necessary for its calcination, even at high capacities of operation.

The study of surface also embraced the study of voids, total voids and such voids as are available to gas flow. It was important to know resistance to gas flow, gas path available and pressure required at different rates of flow.

Penetration had to be considered, not only that halving the size of stone doubled the surface, but penetration required was reduced by half, so there was a double gain.

Then the subject of gas volumes was taken into account. Surface may be increased, but to work this surface must receive its quota of combustion gases and gases do not pass through small voids as readily; resistance varies as the square, power required climbs rapidly at the cube rate. But this fortunately is offset in good measure by lower kiln heights and by higher efficiency obtained. Therefore, per unit of capacity, a smaller volume of gases is handled.

Important in all this is the heat to be transferred per unit of kiln space and per unit of active surface. The temperature difference prevailing had to be considered when the "Idle Zone" of conventional kilns was discovered; a zone to be found in all kilns wherein temperatures of stone and of the gases have reached an equalibrium and where none or but little heat was transferred. This was important as it further reduced kiln heights and the necessary power to handle the gases.

Then there was the matter of heat transfer, that from the gas to the solid and heat penetration through the solid. Every step in this revealed further advantages of small stone burning in vertical kilns. It brought forth the low temperature at which the lime could be burned and at the same time the very high capacity.

Practically it was proven that the conventional "hanging" method of kiln operation was not satisfactory, that a free flow of lime through the hot zone was demanded, either through a very frequent drawing or continuous drawing of lime. The small stone kiln therefore was arranged for mechanical drawing.

Hanging cannot be avoided when temperatures are high and high temperatures for other reasons mentioned, were not desirable, but to effectively and thermally attain lower temperatures the system of recirculation (hot zone recirculation) has to be practiced.

The small stone kiln may be made large in cross-sectional area for high kiln capacity, but the section where gas is introduced must be such that no great horizontal distances for distribution of the gas are entailed. The Azbe patented center burner makes this possible.

For large kiln cross-sections or relatively smaller stone the conventional single center burner is not sufficient; two or more are necessary as every small portion of the shaft must obtain its full quota of the gas. In the development work it was proven that there is little tendency for lateral gas distribution with small stone. Any section not obtaining sufficient gas, was all stone, while the adjacent section only a few inches away was all lime.

The design was further arranged to force distribution through the aid of recirculating gas, which mixed with the entering producer or natural gas, and through volume and velocity, forced its distribution over the desired distance from the entrance point. The system called for the introduction of the inert tempering medium either directly into the com-

(Continued on page 108)

FIG. 20

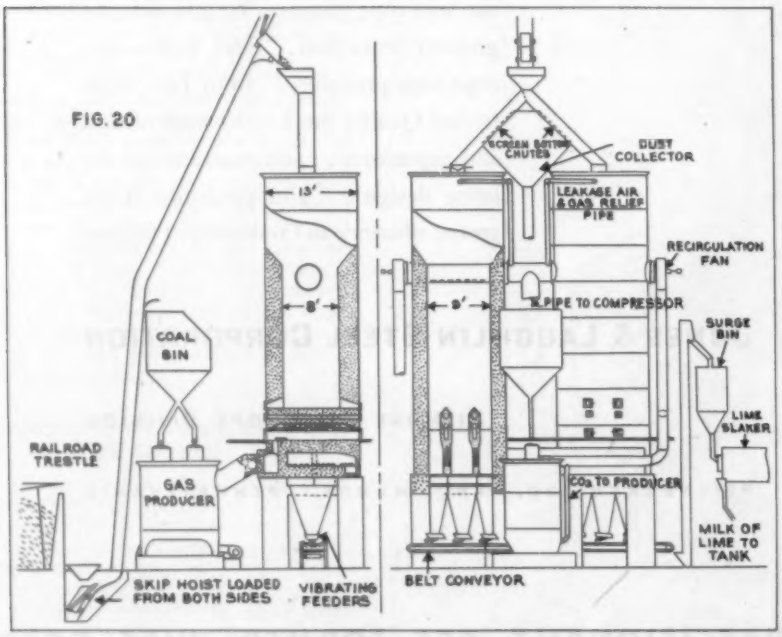

Fig. 20: Kiln and producer arrangement for small-stone kiln

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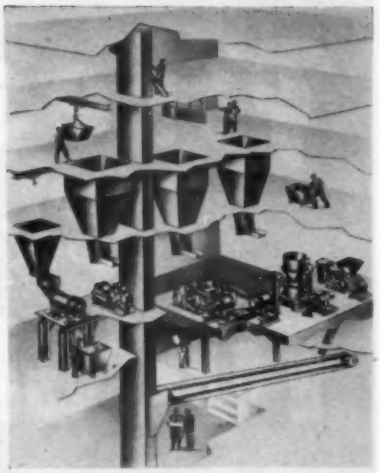
Research Laboratory Pilot Plant

Construct five-floor laboratory to study problems of concentration, recovery and processing of basic raw materials



Three-dimensional cut-away of laboratory plant

For the past two years Allis-Chalmers Manufacturing Co. has been building a new laboratory to more efficiently solve the problems of mining, milling, and wood products industries. Of particular interest to Rock Products readers is the pilot mill, four stories high, where complete facilities are available for studies involving portland cement, nonmetallic minerals and ores of all kinds. A later addition will include an experimental kiln 30 ft. long. On October 16, the company invited the technical press representatives on a tour of inspection of the laboratories.

On the ground floor are storage racks for samples and testing equipment, including variable speed crushing rolls, testing sieves, a specially designed sieve shaker for making screen analyses on coarsely crushed products, a 200,000 lb. hydraulic press, and a concentrating table.

The crushing section contains three 10-ton steel bins feeding four crushing machines on the ground floor. The crushers discharge to a belt conveyor feeding a 54-ft. bucket elevator which discharges through an automatic sampler directly to third floor bins. When closed-circuit crushing is desired, crusher discharge goes to a vibrating screen, with undersize going to the bins and oversize returning onto the crusher feeders. The crushing equipment includes: a 10- x 7-in. Blake jaw crusher, a 322 type R gyratory, 24- x 14-in. style B crushing rolls, and an electronic device which permits variation of the relative roll speeds from even to a maximum differential of four to one, and a No. 1 Pulverator (hammermill).

Grinding and concentration test equipment is fed by a 2-ton bin filled from the crushing section elevator, with the installation designed to treat about 500 lb. per hour, a variable speed belt feeder undeer the bin feeding grinding mill. A blade mill and ball and rod mills for wet or dry grinding are provided. The grinding mill discharge flows to a 40-ft. bucket elevator and then through an automatic sampler on the third floor to any of the following separators: a spiral rake classifier, a low-head vibrating screen or an air separator. The grinding mill can operate in closed circuit with any of these separators or in open circuit as desired. A furnace room on the ground floor has electric and gas fired furnaces, a gas fired roaster and pot furnace. There is a 14-cell flotation circuit on the ground floor arranged so that thickened feed can be treated continuously by two-mineral flotation with two stages of conditioning.

The mezzanine floor immediately above the ground floor also contains batch crushing equipment. On the second floor is the grinding testing section with several ball mills, jar mills, pebble mills, a blade mill, and two sieve shakers for screen analyses. The third floor contains the microscope facilities, rock cutting and polishing equipment, magnetic tube tester, centrifuge, electric oven, balance room, and reagents and fume hood for chemical testing. The fourth floor is the batch concentration section devoted especially to flotation and cyanidation tests. The fifth floor is devoted to fine particle size analyses and to cement physical testing. Equipment includes: an infra-sizer, an analyzer, two cement tensile strength testers, a humid closet, and autoclave. An hydraulic classifier is situated below the screen, and below this is a sand cone, for dewatering plant tailings before disposal, and a rake thickener tank.

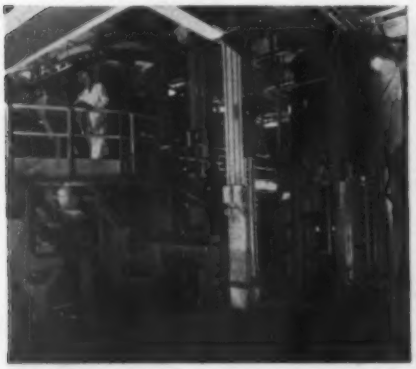
Below on the ground floor are a concentrating table with a small table for cleaning, a Woodbury type jig, a wet magnetic separator, a dry high-intensity 3-roll magnetic separator and one-inch slurry pumps. The pumps discharge to two conical thickeners or agitating slurry tanks on the ground floor, above which is a Moore vacuum filter with three filter baskets and a discharge chute for filter cake.

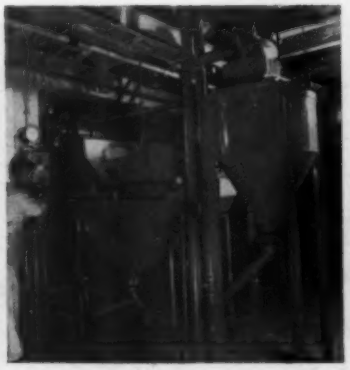
Explosive Regulations

Bureau of Mines has announced that wartime federal regulations governing non-military explosives and certain ingredients of explosives are being relaxed and individual licenses no longer are required for transactions in explosives.

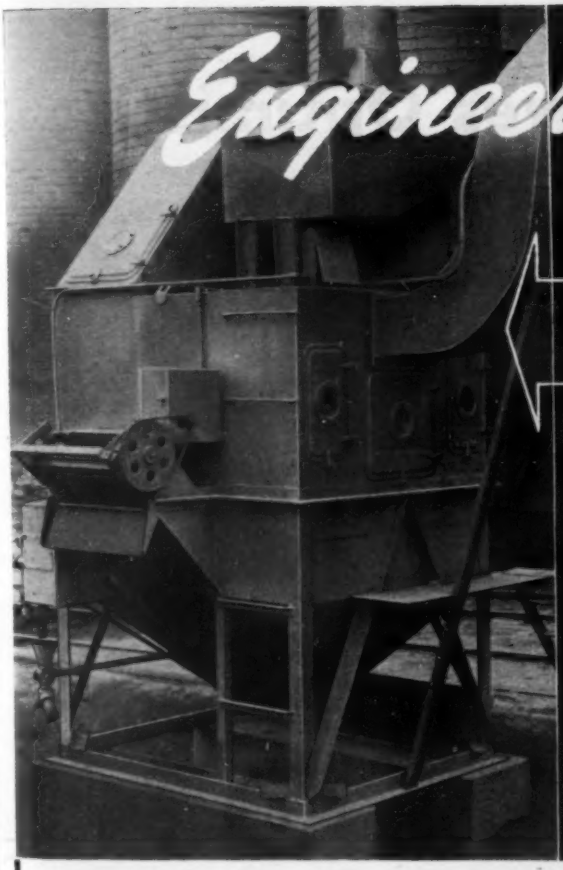
A.S.T.M. Standards

American Society for Testing Materials announces publication of an Index to 1944 A.S.T.M. Standards and Tentative Standards, superseding all previous Indexes





Left: Showing elevator and chutes leading from crushers. Center: Sink-float testing assembly. Right: Two-mineral flotation circuit for differential flotation with two stages of conditioning



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Important among several entirely new types of dust control equipment developed by AAF engineers is the Type N Roto-Clone.* Originally designed for the handling of hazardous magnesium dust in aircraft engine plants, this new wet dust collector has turned out to be unusually valuable to the rock products industry for the collection of certain types of rock dusts.

After being collected and wetted, the collected dust is disposed of in the form of sludge. In addition to the Type N Roto-Clone, the Type W, also a wet type precipitator, and the Type D, dry type precipitator, are in wide use throughout the industry. In fact, there is a Roto-Clone available to meet every requirement of the rock products field. Write for descriptive bulletins.

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FOR ROCK PRODUCT DUST CONTROL

Industry Executives Optimistic in Spite of Confusion

National Sand and Gravel Association and National Ready Mixed Concrete Association decide convention details

BOARD OF DIRECTORS' meetings of the National Sand and Gravel Association and the National Ready-Mixed Concrete Association were held in Chicago, October 18 and 19, respectively. As much of the agenda of each association was the same or similar, the proceedings of the two meetings will be treated in one article.

In spite of the fact that business executives probably have never before witnessed so much confusion in the handling of our national economy, there was evidence of optimism in the future outlook; chiefly perhaps because all believed that most of the wartime controls must soon be released by public demand.

Convention Plans

One of the things uppermost in the minds of the board members was settlement of plans for the 1946, '47 and '48 conventions. The 1946 convention time and place had already been tentatively set for the week of January 21, at the Netherland-Plaza hotel, Cincinnati, Ohio. This precedes the convention of the National Crushed Stone Association at the same place, the following week. This decision was confirmed by action of the board. There will be no exhibit of machinery and accessories, because the exhibitors have neither time nor personnel to provide for such an exhibit, and transportation and hotel facilities are still limited.

On a motion suggested by President "Bob" Mitchell and unanimously adopted, the board voted to hold the 1947 convention in the early part of January in Los Angeles, Calif. This action was taken after full discussion of all angles, and regardless of what action the National Crushed Stone Association may take about its 1947 convention, and regardless of what associate members (machinery manufacturers) may do about an exhibit. Apparently this arrangement is satisfactory to the associate members, and the hope is implied, if not expressed, that in 1948 and every second year thereafter, the three associations, sand and gravel, ready-mixed concrete, and crushed stone will meet in the same week or succeeding weeks at the same place, so that joint exhibits may be had, as for the last several years, with the exception of the war years.

If it is subsequently decided to hold the Road Shows every other year, beginning in 1947, this every-other-year arrangement, alternating with the Road Shows, apparently would work out to everyone's satisfaction. It is a more or less open secret that the desire to hold these exhibits or shows has arisen more for the revenue they produced for the sponsoring association, than because the exhibitors had startlingly new machinery to exhibit each year. Once in two years is probably plenty often enough to illustrate changes and improvements. The associate members are of course welcome and indeed are expected to attend and take part in the in-between conventions.

The convention plans of the National Sand and Gravel Association, outlined above, were endorsed and adopted by the board of the National Ready Mixed Concrete Association, which met on the following day. The programs of the two conventions will be so arranged that no two sessions will be held simultaneously. As heretofore round-table extemporaneous discussions of all kinds of industry problems will take up most of the program.

Wage-Hour Confusion

A subject all producers showed keen interest in is the progress in litigation over the enforcement of the Walling ruling of March 13, 1945, that producers of construction materials used in the construction or maintenance of interstate highways or railways were in interstate commerce within the meaning of the wage and hour law, regardless of the fact that the materials were used locally and were not transported across state lines. Previously, ever since passage of the act in 1938 (Fair Labor Standards Act), the administrator (or his legal advisors) has told the Association members that the Act was not intended to apply to the producers of such locally used material.

The executive secretary of the National Sand and Gravel Association, V. P. Ahearn, has been very eloquent in his denunciation of this change of front by the wage and hour law administrator as a horrible example of administrative law, and his board of directors authorized him to employ legal counsel, on behalf of the association, to contest enforcement of the latest Walling ruling. Mr. Ahearn sees probably more clearly than some producers, how really fatal to a great many producers an adverse court decision would be.

It so happens that the case in which the National Sand and Gravel Association has entered as *Amicus Curiae*, is that of a crushed stone producer in Oklahoma—the E. C. Schroeder Co.—whose case was decided against him in the U. S. District Court, when this court reversed (or technically "amended") a previous decision in his favor. The appeal case is now pending in the U. S. Circuit Court of Appeals, tenth district. Secretary Ahearn has had a brief, prepared in this appeal by Charles A. Horsky and Amy Ruth Malin, attorneys, Washington, D. C., printed and distributed to the members of his association, but more copies are available to any interested producer (including crushed stone). Certainly every producer who is likely to be a defendant in an employes' suit for back wages will find the brief extremely helpful.

Statute of Limitations

Another aspect of the same problem is the differences in the statutes of limitation in the various states, which determine how far back employes may go in suing for back over-time wages. This led to discussion by Secretary Ahearn of the Gwynne Bill (H.R. 2788) now pending action in Congress, which would limit to one year, the time within which the damages under any Federal statute could be applied. All producers are urged to work with their congressmen for passage of this act. One of the provisions of this proposed law is to prohibit any administrative regulation from having any retroactive effect. It is the retroactive effect of this change of interpretation in the wage and hour law which would be so disastrous to the sand and gravel and allied industries.

Secretary Ahearn expressed the opinion that an upping of the present minimum hourly wage from 40c

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Worthington-Ransome Blue Brute Distributors

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Ala., Birmingham (1-2) J. D. Pittman Tractor Co.
Ariz., Phoenix (2) Smith Booth Usher Co.
Phoenix (1) Lee Redman Co.
Ark., Fort Smith (2) R. A. Young & Son
Little Rock (1) Kern-Limerick, Inc.
Little Rock (2) R. A. Young & Son
Calif., Los Angeles (1) Garlinghouse Bros.
Los Angeles (2) Smith Booth Usher Co.
San Francisco (1-2) Coast Equipment Co.
Colo., Denver (2) John N. Meade
Denver (1-2) Power Equipment Co.
Conn., Hartford (2) The Holmes-Talcott Co.
New Haven (1) W. L. Clark
Waterbury (1) Contractors Supply Co.
D. C., Washington (1) M. A. Doetsch Machy. Co.
Fla., Miami (1-2) Allied Equipment, Inc.
Orlando (1-2) High Equip. & Supply Co.
Tampa (1-2) Epperson & Co.
Ga., Atlanta (1-2) Tractor & Machinery Co.
Savannah (1) Morgans, Inc.
Ida., Boise (1-2) Olson Manufacturing Co.
Ill., Chicago (1-2) Chicago Const. Equipment Co.
Chicago (1-2) John A. Roche
Chicago (1-2) Thomas Heist Co.
Ind., Fort Wayne (1) American Steel Supply Co.
Indianapolis (2) Reid-Holcomb Co.
Iowa, Des Moines (2) Electric Eng. & Const. Co.
Ky., Harlan (2) Hall Equipment Sales Co.
Louisville (2) T. C. Coleman & Son
Louisville (2) Williams Tractor Co.
Paducah (1) Henry A. Petter Supply Co.
La., New Orleans (1) Ole K. Olson Co.
New Orleans (2) Wm. F. Surgi Equipment Co.
Maine, Portland (1-2) Maine Truck-Tractor Co.
Md., Baltimore (1) Stuart M. Christhilf & Co.
Baltimore (2) D. C. Elphinstone, Inc.
Mass., Boston, Allston (1-2) Clark-Wilcox Co.
Cambridge (2) Field Mach. Co.
Mich., Detroit (1) T. G. Abrams
Detroit (2) W. H. Anderson Co., Inc.
Dearborn (2), T. G. Abrams
Flint (2) Granaden-Hall & Co.
Muskegon (1-2) Lakeshore Machy. & Sup. Co.
Minn., Minneapolis (1-2) Phillippi-Murphy Equipment Co.
St. Paul (1-2) D. L. O'Brien
Miss., Jackson (1-2) Jackson Road Equipment Co.
Jackson (1) Townsco Equipt. Co.
Mo., Clayton (1-2) The Howard Corporation
Kansas City (1) Brown-Strauss Corp.
Kansas City (2) Machinery & Supplies Co.
St. Louis (2) W. H. Reaves
Montana, Billings (1-2) Interstate Truck & Equip. Co.
Helena (1-2 Caird Eng. Works
Neb., Lincoln (1) Highway Equipment & Supply Co.
N. J., Hillside (2) P. A. Drobach
Newark (1) Johnson & Deslaman
North Bergen (2) American Air Compressor Corp.
N. M., Albuquerque (1-2) Bud Fisher Co.
Albuquerque (1) Morrow & Co.
Roswell (2) Smith Machinery Co.
N. Y., Albany (1-2) Milton-Hale Machinery Co.
Buffalo (2) Dow & Co., Inc.
New York (2) Air Compressor Rental & Sales
New York (1-2) Hodge & Hammond, Inc.
New York (1-2) Railroad Materials Corporation
Nyack (2) Freeborn Equipment Co.
N. C., Raleigh (2) Carolina Tractor & Equip. Co.,
Raleigh (1) Smith Equipment Co.
N. D., Fargo (1-2) Smith Commercial Body Works, Inc.
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Pa., Allentown (2) H. N. Crowder, Jr., Inc.
Easton (2) Sears & Bowers
Harrisburg (2) American Equipment Co.
Oil City (2) Freeborn Equipment Co.
Philadelphia (1) Giles & Ransome
Philadelphia (2) Metalweld, Inc.
Pittsburgh (2) Atlas Equipment Corp.
Wilkes-Barre (2) Ensminger & Co.
Wilkinsburg (1) Arrow Supply Co.
York (2) George F. Matters Sons
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Knoxville (1-2) Dempster Bros., Inc.
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Fairmont (2) Interstate Engineers & Const., Inc.
Wis., Milwaukee (1-2) Drott Tractor & Equipment Co., Inc.
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Blue Brute Tractors

Worthington Pump and Machinery Corp.

Worthington-Ransome Construction Equipment Division

Holyoke, Massachusetts

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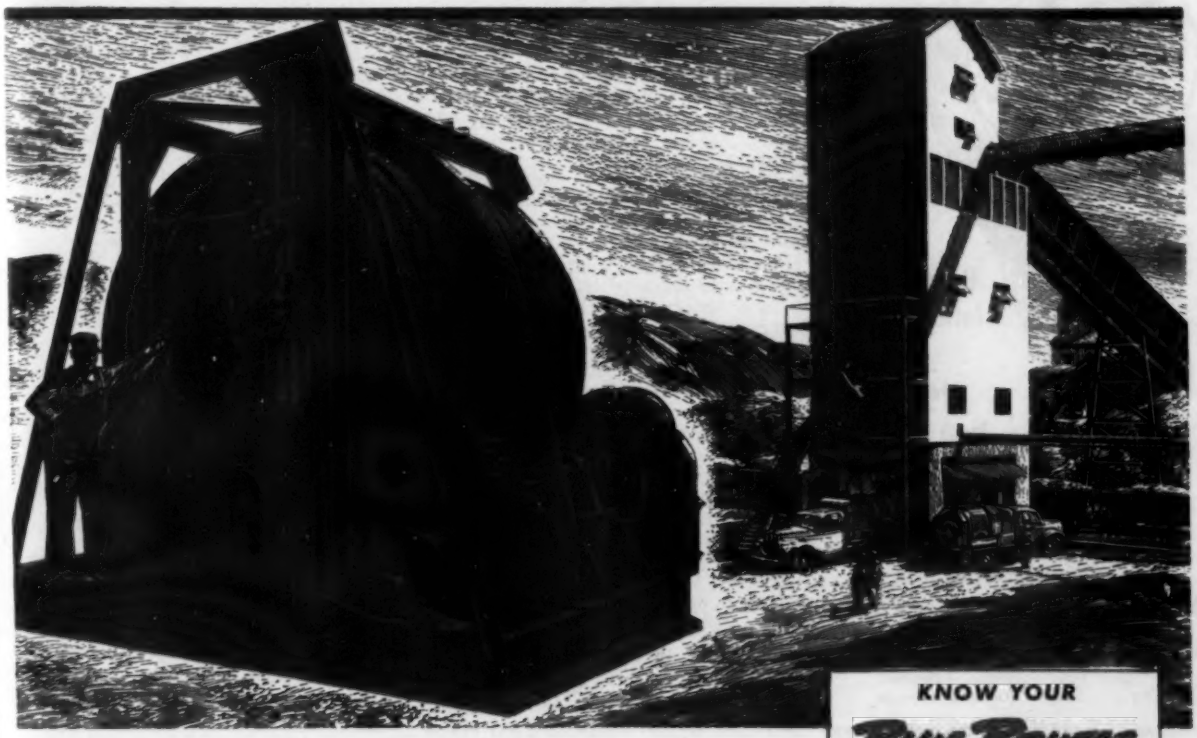
(Continued on page 106)

BETTER CONCRETE IN BIG BATCHES AT LOWER COST



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Look at their record: Ransome built the first "big" mixer back in 1902 for the U.S. Navy Dept. . . . has pioneered all major improvements ever since. Used for some of the world's outstanding construction projects they are first choice too, for central mix operators. A Blue Brute 126-S Mixer owned by Arundel-Brooks Corp. of Baltimore has mixed more than 2,000,000 yards and is still going strong.

Look at their features: Ransome's exclusive mixing action . . . fast, thorough . . . result of 96 years' mixing experience; spiral cut-off water tank and non-by-passing poppet valves . . . for the accurate water measuring that central mixing plants demand; hydraulically-operated discharge chute . . . simple, compact, trouble-free; car-wheel metal drum rollers and true-circle machined-tracks . . . for maintained accurate alignment of drum with driving mechanism.

Check these and the many other features that make Blue Brute "Big" Mixers your best bet for making better concrete at lower cost.

ns. 13

KNOW YOUR BLUE BRUTES

Your Blue Brute Distributor will gladly show you how Worthington-Ransome Blue Brute construction equipment will put your planning on a profitable basis and prove that *there's more worth in Worthington.* Act now! His name is listed on page 104. The number beside his name indicates the Blue Brutes he carries.

1.
Blue Brutes include: Pavers, Concrete Spreaders**, Concrete Mixers, Concrete Placing Equipment, Big Mixers, Finishing Machines**, Pneumatic Placing & Grouting Equipment, Truck Mixers, Plaster & Eituminous Mixers, and related equipment.

2.
Blue Brutes also include: Diesel, gasoline and electric driven Portable Compressors from 60 to 500 cu. ft. capacity in mountings to suit all jobs; Rock Drills and Air Tools in a wide range of weights and sizes; Contractors' Pumps.**

**Proposed Products

BUY BLUE BRUTES

Truck Mixers
Capacities:
2, 3, 4½, 5½ cu. yds.

Portable Mixers
Capacities:
3½, 7, 10, 14 cu. ft.

Big Stationary Mixers
Capacities:
28, 56, 84, 126 cu. ft.

Pneumatic Placer
Capacity:
7, 14, 28 cu. ft.

WORTHINGTON

Worthington Pump and Machinery Corporation, Worthington-Ransome Construction Equipment Division
Holyoke, Mass.

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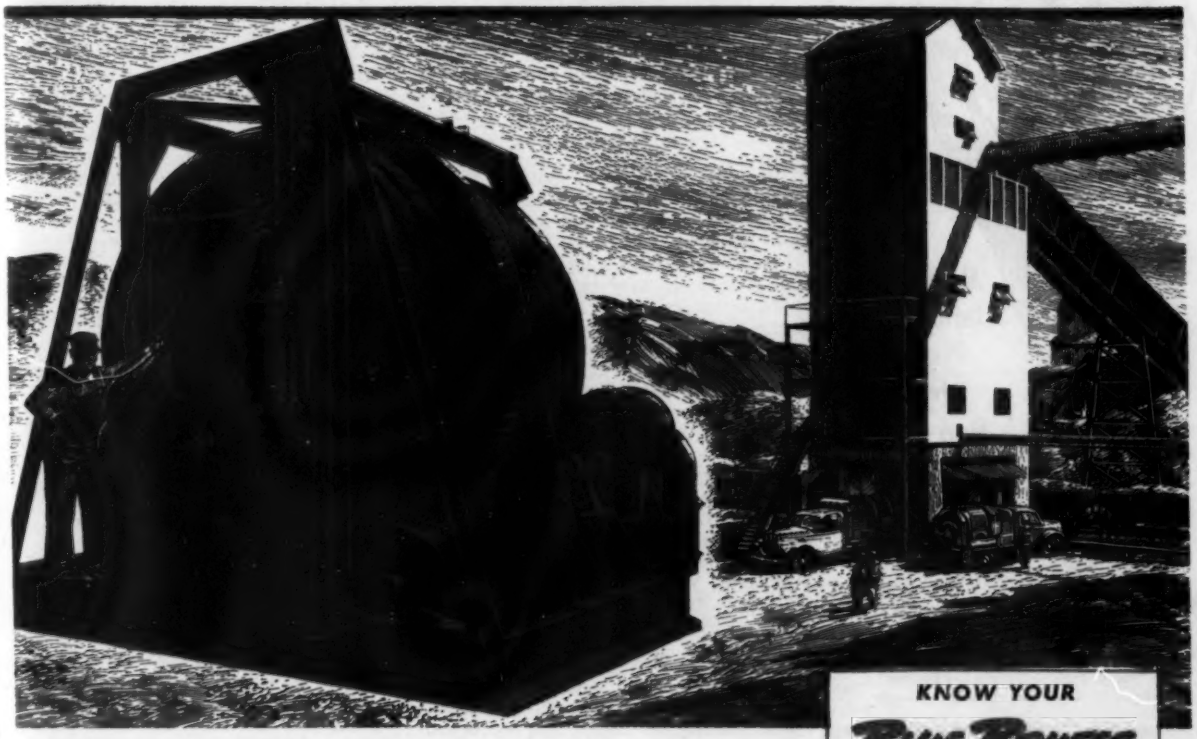

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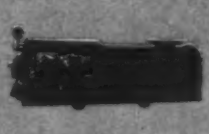


Pneumatic Placer
Capacity:
7, 14, 28 cu. ft.

WORTHINGTON

Worthington Pump and Machinery Corporation, Worthington-Ransome Construction Equipment Division
Holyoke, Mass.

Made of Acid Open Hearth Steel Wire

Round Strand
Flattened Strand
Preformed
Steel Clad
Non-Rotating

The Service Record of this wire rope continues to make and hold friends.

MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

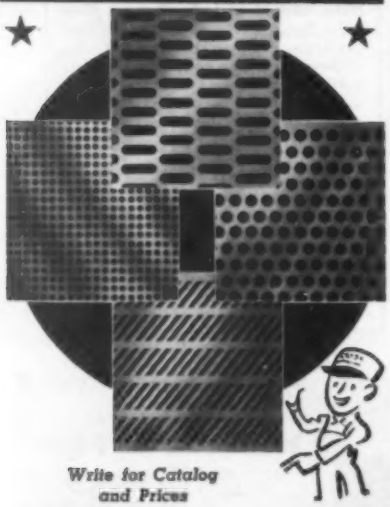
Established 1857

5909 Kennerly Avenue St. Louis, Mo.

New York — Chicago — Denver
San Francisco — Portland — Seattle

YOU CAN DEPEND ON MAXIMUM SCREENING EFFICIENCY *with*

HARRINGTON & KING PERFORATED METAL



Write for Catalog and Prices

The Harrington & King Perforating Co.

5650 FILLMORE ST., CHICAGO 44, ILLINOIS
114 LIBERTY ST., NEW YORK 6, N. Y.

Directors' Meetings

(Continued from page 104)

able personnel, but these difficulties are about over, and soon there will be two or three holders of the N.S. & G.A. Research Fellowships at the University of Maryland. Also a new building is to be erected with special provision for research facilities in aggregates and concrete.

Present research is chiefly concerned with the effect of soft particles in gravel, tested by freezing and thawing concrete containing them. These and other freezing and thawing tests have led to considerable doubt as to the ability of any concrete to long resist freezing and thawing, when the concrete is frozen in a saturated condition.

Laboratory tests have shown that 10 percent of soft particles in the coarse aggregate are not materially harmful to concrete, although most state highway specifications limit the amount to not over 5 percent, often 3 percent. One of the problems in interpreting specification limits is to find a method of evaluating "soft" particles. Mr. Walker suggested this might be done by Los Angeles rattler tests in which a fixed ratio might be set between the loss at 100 revolutions and at 500.

Mr. Walker emphasized that such research as the association could do must not be too broad. A good deal of his thought was to develop subjects which would stimulate other researchers to continue. A study of all the different kinds of rock or mineral found in gravels would be interesting, but too broad for such a staff as the association could have. Similarly a study of sand grading and its effect on concrete properties is needed, and the government agencies are interested. Tests of chert in gravel have developed some definite results, and the next step is a field test. Experimental concrete pavements will soon be built. Much, apparently, depends on the amount of water in chert gravel at the time it is used.

Air-Entraining Cements

At the National Ready Mixed Concrete Association directors' meeting great interest, as usual, was shown in the use of air-entraining cements. Mr. Walker expects many new specifications for concrete and greater use of ready-mixed concrete, particularly for highway pavements. One development at the meeting was the passing of a resolution asking the A.S.T.M. Committee C-9 to revise its requirement that ready-mixed concrete be conveyed in agitator trucks only. The way should be opened to convey it in dump bodies, or other types, under certain conditions.

Two new committees of the Ready Mixed Concrete Association are busy on designs for truck chasses and on weighing and measuring devices.

The new research fellow for the association has been busy at the University of Maryland for the last six months. He is a graduate of the University of Iowa—Delmar L. Bloem—who was present to meet the members of the board.

Experiments by Robt. T. Porter, Harry T. Campbell Sons Co., Towson, Md., show that results with Vinsol Resin—a neutral solution applied in the mixer—were quite different with various different brands of cement.

Registration

Those attending the board meeting of the National Sand and Gravel Association were:

V. P. Ahearn, National Sand & Gravel Association, Washington, D. C.

Theo. Aulmann, Eagle Iron Works, Des Moines, Iowa.

William M. Avery, Pit and Quarry Publications, Chicago, Illinois.

H. D. Bellamy, Concrete Materials & Construction, Co., Cedar Rapids, Iowa.

W. A. Bliss, Dravo Corp., Pittsburgh, Pennsylvania.

Lloyd S. Brannan, Brannan Sand & Gravel Co., Denver, Colo.

H. P. Caldwell, Ohio River Sand Co., Louisville, Ky.

Claude L. Clark, Ohio Sand & Gravel Association, Columbus, Ohio.

Otto S. Conrades, St. Louis Material & Supply Co., St. Louis, Mo.

R. N. Coolidge, Cumberland River Sand Co., Nashville, Tenn.

H. S. Davison, J. K. Davison & Bro., Pittsburgh, Penn.

O. J. Ellingen, Conco Building Products Inc., Mendota, Ill.

R. C. Fletcher, Flint Crushed Gravel Co., Des Moines, Iowa.

Alexander Foster, Jr., Warner Co., Philadelphia, Pa.

F. C. Fuller, Portsmouth Sand & Gravel Co., Portsmouth, Ohio.

Wm. S. Giles, Iron City Sand & Gravel Corp., Vang Ready-Mixed Concrete Company, Pittsburgh, Pa.

E. J. Goodpastor, Pacific Coast Aggregates Inc., San Francisco, Calif.

Paul C. Graham, Graham Bros, Inc., Los Angeles, Calif.

D. D. Guilfoil, Sauerman Bros. Inc., Chicago, Ill.

J. Rutledge Hill, Gifford-Hill & Co., Inc., Dallas, Tex.

V. O. Johnston, Lincoln Sand & Gravel Co., Lincoln, Ill.

Arthur A. Levison, Blaw-Knox Division, Pittsburgh, Pa.

Robt. Mitchell, Consolidated Rock Products Co., Los Angeles, Calif.

E. J. Nunan, Buffalo Slag Co., Buffalo, N. Y.

H. F. Garvin Pelsue, Metropolitan Sand & Gravel Corp., New York, N. Y.

Stanley A. Phillips, Pit and Quarry Publications, Chicago, Ill.

Tom Popplewell, Fort Worth Sand & Gravel Co., Fort Worth, Tex.

J. P. E. Price, Wyoming Sand & Stone Co., Scranton, Pa.

G. W. Renwick, Chicago Gravel Co., Chicago, Ill.

Nathan C. Rockwood, Rock Products, Chicago, Ill.

John W. Shaver, Concrete Publishing Corp., Chicago, Ill.

Albert R. Shiely, J. L. Shiely Co., St. Paul, Minn.

Harris N. Snyder, The Buffalo Slag Co., Inc., Buffalo, N. Y.

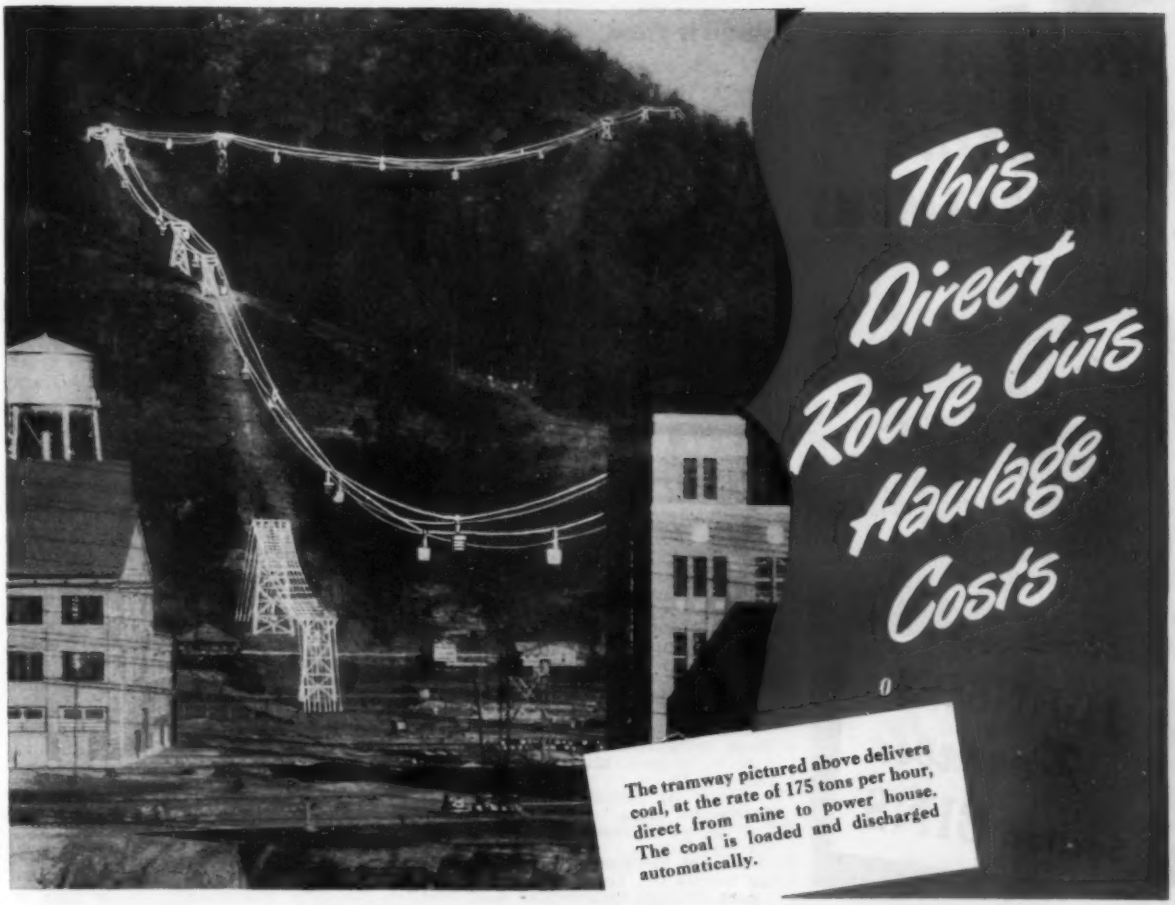
Frank P. Spratlen, Jr., Spratlen-MacDugall, Inc., Ready-Mixed Concrete Co., Denver, Colo.

Stephen Stephanian, The Arrow Sand & Gravel Co., Columbus, Ohio.

E. Guy Sutton, Neal Gravel Co., Mattoon, Ill.

Ray V. Warren, Pennsylvania Sand &

(Continued on page 108)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The tramway pictured above delivers coal, at the rate of 175 tons per hour, direct from mine to power house. The coal is loaded and discharged automatically.

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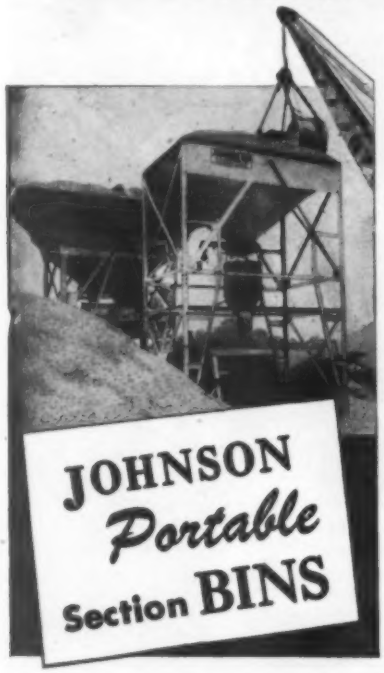

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Johnson portable section steel bins are made with one, two or three compartments. When need arises, the two-compartment bin can be quickly converted to three compartments, or vice versa, in the field.

The Improved Roadbuilders' Multiple Batcher

The Johnson Roadbuilders' Multiple Aggregate Batcher fits the bin opening of Johnson Portable Section Bins. This batcher is provided as either a 2 or 3 material batcher. Two material batchers are convertible to three materials in the field by addition of one filling valve and one weigh beam. The new weigh beam features machine faced poised weights and notched beam for greater accuracy and moisture compensation graduation on each weigh beam. This is an exclusive feature with no loose parts involved and permits prompt and convenient adjustment for moisture content.

The C. S. JOHNSON COMPANY
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Registration

(Continued from page 106)

Gravel Producers Association and Ready-Mixed Concrete Association of Metropolitan Pittsburgh, Pittsburgh, Pa.

R. E. Weaver, Lincoln Sand & Gravel Co., Lincoln, Ill.

W. H. Wyckoff, Merom Gravel Co., Indianapolis, Ind.

Stanton Walker, National Sand & Gravel Association, Washington, D. C.

N.R.M.C.A.

Members and guests registered at the board meeting of the National Ready Mixed Concrete Association were:

W. H. Acheson, Somers-Barr Co., Inc., Urbana, Ill.

V. P. Ahearn, National Ready-Mixed Concrete Association, Washington, D. C.

Delmar L. Bloem, National Ready-Mixed Concrete Association, U. of Maryland.

Claude L. Clark, Ohio Ready-Mixed Concrete Association, Columbus, Ohio.

Glenn C. Cook, American Builders' Supply Co., Louisville, Ky.

H. S. Davison, J. K. Davison & Bro., Pittsburgh, Penn.

E. K. Davison, J. K. Davison & Bro., Pittsburgh, Penn.

Barney Devine, Chain Belt Co., Milwaukee, Wis.

Alex. Foster, Jr., Warner Co., Philadelphia, Penn.

Wm. S. Giles, Vang Ready Mixed Concrete Co., Pittsburgh, Penn.

E. J. Goodpastor, Pacific Coast Aggregates, Inc., San Francisco, Calif.

C. Dolly Gray, Ready Mixed Concrete Corp., Indianapolis, Ind.

J. W. Hunter, Material & Fuel Co., Danville, Ill.

Arthur A. Levison, Blaw-Knox Co., Pittsburgh, Penn.

R. McLean, Jaeger Machine Co., Columbus, Ohio.

James F. McCracken, American Builders' Supply Co., Louisville, Ky.

Robt. Mitchell, Consolidated Rock Products Co., Los Angeles, Calif.

Ed. J. Nunan, Buffalo Slag Co., Buffalo, N. Y.

Charles Payton, Universal Atlas Cement Co., Chicago, Ill.

H. F. Garvin Pelsue, Metropolitan Sand and Gravel Co., New York City.

H. C. Peters, T. L. Smith Co., Milwaukee, Wis.

S. A. Phillips, Pit and Quarry, Chicago, Ill.

Tom Popplewell, Lubbock Building Products, Lubbock, Tex.

Robt. T. Porter, Harry T. Campbell Sons Co., Towson, Md.

Nathan C. Rockwood, ROCK PRODUCTS, Chicago, Ill.

Jos. M. Scheinin, James A. Norton, Inc., New York City.

John W. Shaver, Concrete, Chicago, Ill.

Al. R. Shiely, J. L. Shiely Co., St. Paul, Minn.

Louis C. Shilling, J. E. Shilling, Miami, Fla.

Charlie C. Shirey, C. W. Shirey, Waterloo, Iowa.

Frank P. Spratlen, Ready Mixed Concrete Co., Denver, Colo.

Stephen Stepanian, Arrow Sand and Gravel Co., Columbus, Ohio.

H. F. Thomson, General Materials Co., St. Louis, Mo.

Stanton Walker, National Ready Mixed Concrete Association, Washington, D. C.

Ray V. Warren, Ready Mixed Concrete Association, Pittsburgh, Penn.

Julius J. Warner, Richter Concrete Co., Cincinnati, Ohio.

J. H. Williams, The Conveyor Co., Los Angeles, Calif.

Fuller's Earth

BUREAU OF MINES reports 19 per cent greater production in 1944 than in 1943. The total sold or used by producers in the United States was 294,737 short tons valued at $3,297,064. Florida, Georgia, Illinois and Texas together produced all but 12,594 tons.

Lime Burning

(Continued from page 98)

bustible gas or separately but adjacent to it.

It was essential that the combustible gas, the medium delivering heat, as well as the medium tempering heat and dispersing it be properly distributed. Therefore the various ducts of the center burner were especially devised to accomplish this and were equipped with slides for regulation. Thus the amounts of primary air, of combustible or heat-bearing gases and of the tempering medium could be controlled and the point of their delivery regulated for attainment of the desirable, uniform temperatures.

If the lime is not hung it is difficult to tell how much lime there is in the different zones and to what the lime drawing mechanism should be adjusted. Some idea must prevail if lime passing out of the hot zone into the cooler is lime. One could not well wait until it appeared at the draw. To overcome this difficulty, the center burner was given a new duct. It is an idle duct and no gas or air passes through it into the kiln; it is open to the outside and is purely an observation duct. If its walls present a certain temperature then the lime surrounding it is lime in fact; if hotter, the drawing must be speeded up; if cooler, slowed down. This simple system is only possible with small stone because when stone is small then at a certain surface temperature it cannot well be anything but lime, while in the case of large stone the surface may be hot while there is still a great deal of core.

Another advantage of small stone and this kiln is that temperature harms lime more than time of exposure, with temperatures being low, lime can be retained in the hot zone much longer without impairing its properties.

Therefore, in these kilns lime can be carried high, so high that even occasional core is burned out, so high that there is virtually no residual CO_2 remaining, no portion of it recarbonated.

Fig. 18 does not portray the kiln as a whole but only sections pertinent to the subject. In Fig. A the large stone storage area is not included, it begins with the kiln offtake pipe (1). This pipe has a double connection; one leads to the exhaust fan (2), the other leads to (3), the hot zone recirculating pipe (4). By means of a damper (5) and slides (6), the gas supply to recirculating fan can be blended in any manner desired.

(Continued on page 110)

Contractors:
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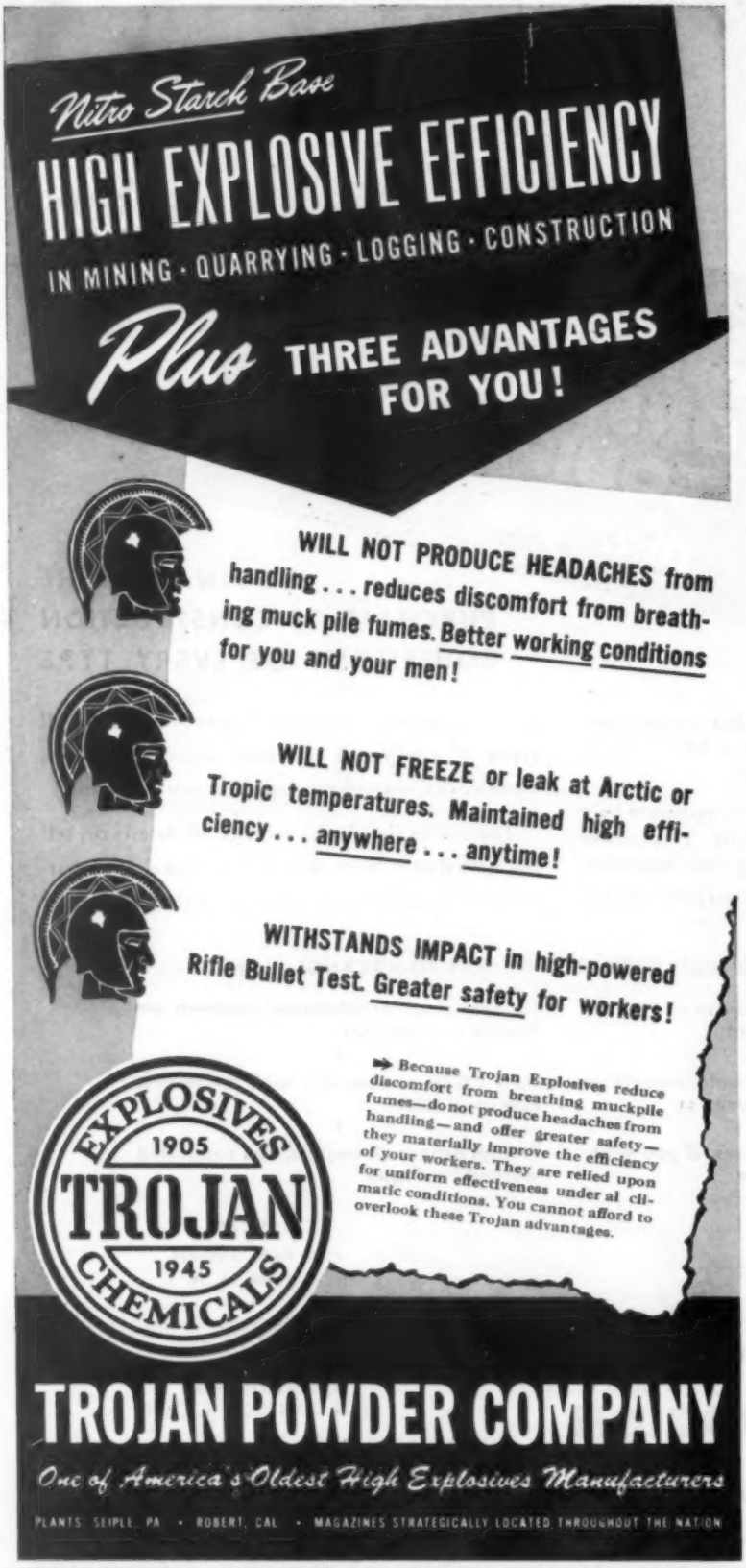
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The recirculating gas can be introduced into the main combustible duct or ducts, (8) to temper either producer or natural gas or oil for that matter. Or it may be introduced as shown into the duct (9) whose purpose is the delivery of this tempering and turbulency creating volume at exit ports (10).

Air is brought into the kiln by fan (11), although same may also enter through the draw gates (12). The air from the fan is distributed by duct (13), where proper distribution is accomplished by slides (14).

The combustible gas enters supply duct (15), and from there the distributing duct (16), where again slides assume control over proper distribution.

It will be noted, that in respect to air, combustible, as well as the tempering gas, controls are provided over both the total volume and the distribution. To have proper distribution is extremely important; a small stone kiln without distribution control is a failure.

Shown at (17) is the observation duct through which the heat of the respective zones is gauged.

While for small capacity there may be only a simple center burner (18), for higher capacity there would be a greater number, permitting large shafts and production of large quantities of lime. The spaces between center burners (19) are narrow, thus assuring the required gas penetration. The center burners are narrow too, but they carry no heavy load and under the very heavy recirculation, which the system demands, are not exposed to high temperatures and are not subject to rapid deterioration.

The kiln is also equipped with some strategically located trimming doors (20), to break in the lime if it should hang.

In different kilns there may be variations fitting them to particular purposes; burners in side walls, controlled substantially as in the case of the center burner and equipped with provisions for spot delivery of recirculating gas. Or the producer gas and recirculating gas may be allowed to exude from the same port together.

The kiln is many sectioned as to draw mechanism. It may have three, four, six or eight draw hoppers (21) electrically tied in with the main combustible gas control for in-step operation.

When natural gas is the fuel, large ducts as (8) are unnecessary and ducts 10 and 15 become a series of small ducts leading natural gas selectively to the burner ports with all of the other features remaining approximately the same in principle.

Install Hammermill

SOMERSET QUARRIES, Somerset, Penn., plans to install a hammermill in the agstone producing plant.

Modernize Dredge

(Continued from page 89)

help minimize segregation while loading. A further precaution against that evil, which is resorted to at this dredge, is to load a barge only half-high on one pass, putting on the full load by spotting the barge twice. This double spotting for one loading is performed readily on this dredge because individually electrically controlled winches are used throughout and, as mentioned earlier, d-c machinery makes for easy control.

Sand going through the pair of 6- x 12-ft. vibrating screens are discharged into a sump designed to lose as little to overflow as possible, as the latter discharges to the river, and often contains the 100-mesh material needed to meet that portion of the specifications covering those for concrete-making sand.

A similar bucket elevator to that used for the 1¼-in. x 6-mesh gravel, is employed to pick up the sand out of the sump, the buckets of which discharge to barge direct via a rubber-lined, articulated, steel chute. This chute cannot only be raised and lowered (to a maximum flatness of 45 degrees with the horizontal) but discharges partial loads along its length through traps in the bottom.

The fleet of barges totals 58 in number, 51 of which have a capacity of 500 tons each. Four are loaded simultaneously, two on each side of the dredge and arranged side by side. This permits the longitude of movement required to load a particular barge from one belt, a free length of approximately 270 ft. being required for the 500-ton barges.

The heaviest sprays of wash water are employed on the twin 6- x 12-ft. screens but considerable washing is also done on the 5- x 10-ft. screen. All water is supplied by a 10-in. DeLaval centrifugal pump fitted with a bronze impeller, and which is capable of delivering 3000 g.p.m. This pump is installed in the hull below the water line to eliminate priming troubles.

The dredge boat, which is 198 ft. long x 45 ft. beam x 6 ft. 8 in. draft, moves about from place to place in its area of operation by means of shore lines wound on electrically operated capstans, of which there are four in number, one on each corner of the lower deck. Four 60-ft. long, 24- x 24-in. Douglas Fir, reinforced, iron tipped spuds act as anchors. These are used to "walk" with when the dredge boat is relocating. They are also operated electrically, through individual winches. Power data is given in the table below:

Power Plant Data on Dredge

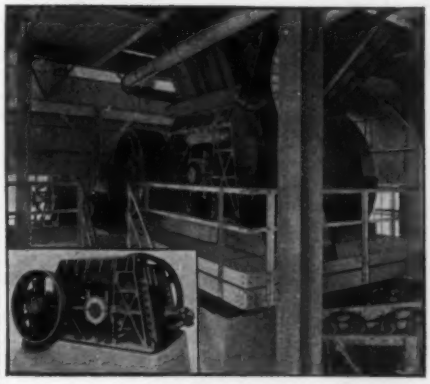
2—300-hp. Heine, water tube boilers (coal fired).

1—Kerr-Elliot steam turbine, 725-hp. @ 3600 r.p.m.

(Continued on page 112)

PENNSYLVANIA

"PENNSYLVANIA" PENN-LEHIGH SINGLE ROLL PRIMARY



Powerfully STEELBUILT—with wide reduction ratios—PENN-LEHIGH Single Rolls are specially adapted for the primary non-clog crushing of heavy Steam Shovel feeds—Cement-making Materials, Limestone, Gypsum and Ores—dry or wet.

Six (6) sizes, for capacities 200 to 1000 tons hourly.

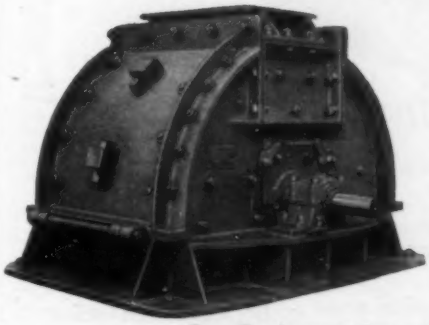
"PENNSYLVANIA" REVERSIBLE HAMMERMILL

This STEELBUILT Hammermill, of the "Pennsylvania" High Drop Central Feed REVERSIBLE TYPE, makes the secondary reduction of Cement-making materials in the World's latest Cement Plant—at the rate of 500 tons per hour.

Automatic Hammer Turning—Increased Capacity, Finer Crushing—and Sharply Cut Maintenance Costs, were controlling factors in this selection.

Fifteen (15) sizes to meet all requirements.

"PENNSYLVANIA" REVERSIBLE IMPACTOR



Developed initially for the reduction of abrasive materials to granular products, "Pennsylvania" REVERSIBLE IMPACTORS are rapidly finding broader applications.

In closed circuit operation, "Pennsylvania" Impactors deliver products efficient for grinding in the Cement, Industrial Mineral, Metalliferous Ore and other Mining Industries, at notably low maintenance costs and simple layouts.

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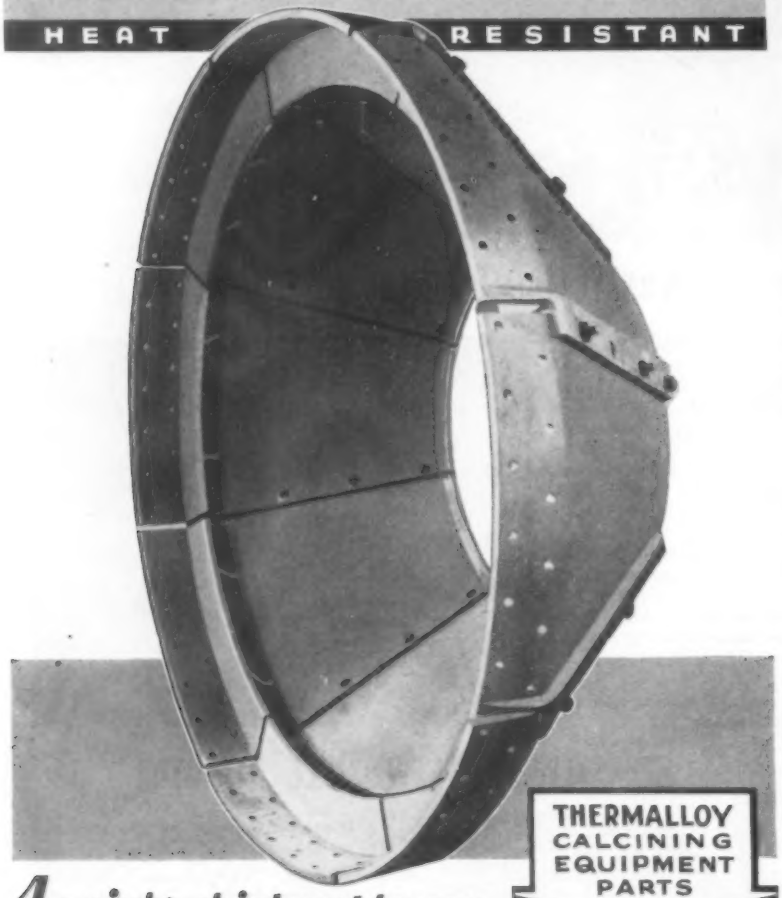

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1—Sound DESIGN and sound FOUNDRY PRACTICE assure sound CASTINGS.

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3—The best possible balance of physical properties reduce cracking and excessive warping.

4—Brick lining troubles are materially reduced, eliminating expensive shutdowns.

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HEAT AND CORROSION RESISTANT CASTINGS

Modernize Dredge

(Continued from page 111)

1—Worthington vacuum pump, 1200 sq. ft. condenser.
1—500 kva. General Electric direct-current generator, delivering 1820 amperes at full load.

Office on board the dredge. From left to right: R. E. Daniel, chief engineer; Frank Olsheski, dredge captain; and Ed. K. Davison, production engineer

1—250 hp. d.-c. motor, digging ladder.
1—110 hp. d.-c. motor, boom hoist.
1—50 hp. d.-c. motor, water pump.
2—50 hp. d.-c. motor, sand and gravel elevators.
2—25 hp. d.-c. motors, 6- x 12-ft. vibrating screens.
1—15 hp. d.-c. motor, 5- x 10-ft. screen.
1—25 hp. d.-c. motor, common drive for pair of conveyor belts.
6—15 hp. d.-c. motor, winches and capstans.
4—7½ hp. d.-c. motor, spud anchors.

Working conditions are clean and safe, with good sleeping accommodations provided when rare conditions of weather or operation make it advisable for the crew to remain overnight. Not the least of the boat's equipment is a huge refrigerator amply stocked with fresh vegetables, cuts of meat and fowl. A well appointed mess hall adds to the domestic atmosphere created by the regularly served, excellent home-cooked meals, to the wholesomeness of which the writer can personally attest.

J. K. Davison & Bro., which also operates a crushing plant at New Kensington, Penn., is headed by Geo. McC. Davison, president; H. S. Davison, secretary and treasurer; R. E. Daniel, chief engineer; E. K. Davison, production engineer, G. H. Williamson, production superintendent, and Frank Olsheski, dredge captain.

Add Ready Mix

GLACIER SAND & GRAVEL CO., Seattle, Wash., is planning to erect a new ready mixed concrete batching plant. This company is now identified with the Henry J. Kaiser interests.

Feldspar in Heavy Demand

OUTPUT of both crude and ground feldspar in 1944 increased sharply over 1943, stimulated by an active market for glass, glass products, chinaware and pottery, according to Bureau of Mines statistics. Crude spar sales were the highest on record, 10 percent over 1943, and ground feldspar established a new high with a two percent gain over 1941, the previous high record year.

Domestic sales of crude in 1944 were 327,408 tons for $1,813,937; ground feldspar sales by merchant mills were 343,201 tons with a value of $3,863,036. The demand for feldspar in the postwar period is expected to be high as so much of the product goes into glass and building tile.

With the expansion of the feldspar market and the exhaustion of the better grades of spar some thought is being given to the beneficiation of low grade feldspars. For several years, a certain amount of run-of-mine spar has been processed by fine grinding, and the removal of impurities either by screening or air separation, followed by magnetic separation. The application of flotation methods to the refining of feldspar, however, is a new and promising development, according to the Bureau of Mines. A plant recently has been placed in operation in North Carolina to treat alaskite rock, which is a quartz-feldspar pegmatite occurring in abundance in the Spruce Pine area in that State. The widespread distribution of feldspar in rock of a type similar to alaskite, in granites and in other commonly occurring rocks, points to an almost unlimited reserve, which with the development and perfection of flotation separation would become available. It is believed that with flotation separation, mining methods may be changed from the present comparatively small, widely separated diggings to more extensive operations.

Calcium Chloride Production

BUREAU OF MINES reports production of natural calcium chloride and calcium-magnesium chloride in 1944 to be 200,964 short tons valued at $1,621,227. Principal uses are for road stabilization, concrete mixing, and coal cleaning. Although the tonnage only represents a slight increase over that produced in 1943, postponed road work and construction are expected to provide a good market for this product in postwar years.

To Sell Ready Mix

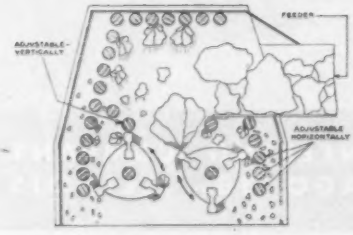
TIM CORLISS of Sumner, Wash., has plans to increase storage capacity and modernize his plant. It is also planned to add ready mixed concrete batching facilities, according to a local report.

1 NEW HOLLAND CRUSHER DOES 2 JOBS FOR INDIANA LIMESTONE PLANT . . . .

● One New Holland Model 3030 Double Impeller Crusher is doing both the PRIMARY and SECONDARY crushing at the McCorkle Stone Co., Milroy, Ind., agstone plant.

Because it successfully crushes run of the quarry stone as large as 30" to an optional minimum of 80% minus 1", the 3030 crusher is doing the whole pulverizing job for McCorkle. At present, the crusher is producing approximately 40 tons per hour of agricultural limestone, but company officials report it will easily reduce stone from 30" to 1" at the rate of better than 100 tons per hour.

This 3030 double impeller crusher will do the same job for you in your stone crushing plant. You'll like the low maintenance costs. Wearing parts are designed for quick, inexpensive replacement. Write to Dept. RP-11 for details.



HOW IT WORKS

Impacting action of the two gigantic impellers, operating clockwise and counterclockwise, strikes the stone in midair as it enters the crusher. Material is thrown upward against the breaker bars and rebounds to the impellers. This process continues until the stone is reduced to the required size when it passes around the impellers and out through the discharge openings. Impellers travel at adjustable speeds of 250 to 1000 rpm. Size of finished product is easily and quickly controlled. Manganese steel impeller bars have four striking faces and are made to be reversed when worn.

Let N. H. Engineers plan your set-up for producing agricultural limestone or crushed aggregates. The most economical way is with the Model 3030 and other N. H. equipment.

NEW HOLLAND MACHINE CO.

NEW HOLLAND PENNSYLVANIA

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BUCKETS
ARE USED ALL
OVER THE WORLD
From war-torn China, from liberated islands in the South Pacific, from the most remote corners of the world, come reports of how Page Automatic Buckets are successfully day after day doing the job for which they were designed.
The Bucket illustrated is a 2½-cubic-yard Automatic

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CHICAGO 38, ILLINOIS

UNIVERSAL VIBRATING SCREENS

give best results

Guaranteed to give you best results on your most difficult separations. UNIVERSALS are of rugged yet simple construction, lowest in first cost and in maintenance. UNIVERSALS have been tried and proved in 25 years of dependable service.

Write for 32-page catalog on screens and screening.

Type "MR" 42"x96" Double Deck

★ ★ ★ UNIVERSAL VIBRATING SCREEN CO. ★ ★ ★
RACINE - - WISCONSIN

Statement of the Ownership, Management, Circulation, Etc., Required by the Act of Congress of August 24, 1912, and March 3, 1933

Of ROCK PRODUCTS, published monthly at Chicago, Illinois, for November 1, 1945.

State of Illinois, County of Cook, ss.

Before me, a notary public in and for the State and county aforesaid, personally appeared Charles Hoefer, Jr., who, having been duly sworn according to law, deposes and says that he is the Business Manager of Rock Products and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor and business manager are:

Publisher—Maclean-Hunter Publishing Corporation, 309 W. Jackson Blvd., Chicago 6, Ill.

Editor—Bror Nordberg, 309 W. Jackson Blvd., Chicago, Ill.

Managing Editor—Ralph S. Torgerson, 309 W. Jackson Blvd., Chicago, Ill.

Business Manager—Charles Hoefer, Jr., 309 W. Jackson Blvd., Chicago, Ill.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

Maclean-Hunter Publishing Corporation, 309 W. Jackson Blvd., Chicago 6, Ill. The stockholders of the Maclean-Hunter Publishing Corporation are John R. Thompson, 2511 Coyle Avenue, Chicago; J. L. Frazier, 2043 Orrington Ave., Evanston, Ill.; Col. J. B. Maclean, 7 Austin Terrace, Toronto, Ont., Canada; Horace T. Hunter, 120 Inglewood Drive, Toronto, Ont., Canada; The Maclean Publishing Co., Ltd., 481 University Avenue, Toronto, Ontario, Canada.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown

above is: (This information is required from daily publications only.)

CHARLES HOEFER, JR.,
Business Manager.

Sworn to and subscribed before me this 26th day of September, 1945.

(Seal) M. E. JOHNSTON.

(My commission expires Oct. 20, 1945.)

Sieve Analyses of Sands

NATIONAL SAND AND GRAVEL ASSOCIATION has collected 4448 analyses in response to the request made in Technical Information Letter No. 45 for sieve analyses of sands. These represent 214 sources in 27 States and are compared with A. S. T. M. (C 33) and Corps of Engineers, U. S. Army, specifications. Most failures to meet specifications were caused by an inadequacy in the percentage finer than 100-mesh. There were also a larger number which failed due to a deficiency in material finer than 50-mesh. Deficiencies in material coarser than 8-mesh, according to Army standards, were also recorded. Fifty-five percent of the sources showed average fineness moduli in excess of 2.90—the maximum permitted by the new Army Civil Works Specification.

"Light from Floors"

A 24-PAGE BOOKLET, "Light from Floors" by the Universal Atlas Cement Company, Chrysler Bldg., New York, points out the advantages of using white cement for making floors in factories, offices, schools, libraries and other public buildings, where lighting is important. Comparative lighting tests made by General Electric Co. engineers are quoted to show the difference in the reflective power of gray vs. white concrete. Sections of the book are also devoted to recommended practice for floor construction, surface treatment, and maintenance.

Mica Splitting Machine

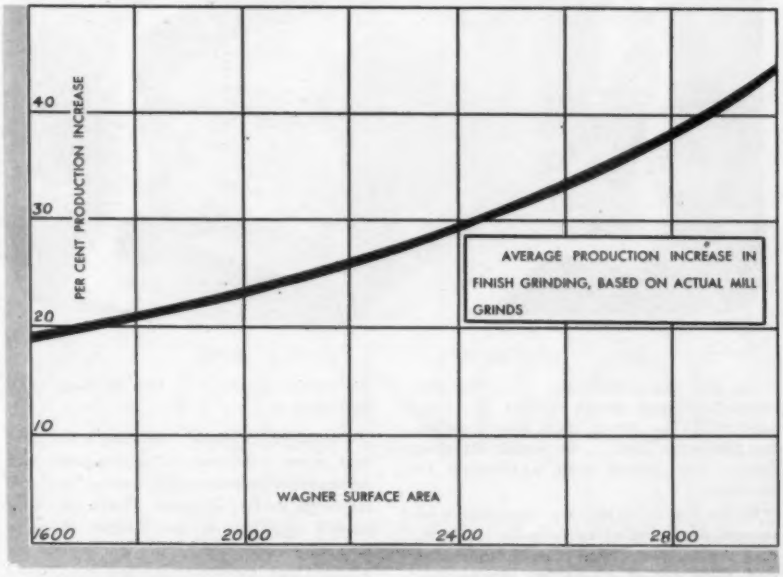
BUREAU OF STANDARDS has announced that D. W. Kessler has developed a machine for splitting mica block into sheets of 1- to 3-mills in thickness at a faster rate than that by hand. The device consists of a suction disc carrying six chuck plates so that six blocks of mica can be loaded at one time. This plate slides back and forth on a track. A stationary gage which starts a split at each return stroke, lifts the film up so that a pair of stripper blades can complete the separation. A suction belt removes the separated film.

Experimental Lime Plant

LOUISIANA is going ahead with its experimental agricultural limestone plant at Slidell, La., a fund of $17,500 having been appropriated by the legislature. Representative Baker objected to the appropriation on the grounds that the State should not go into the "lime business."

You can keep
GRINDING COSTS DOWN
with TDA

That's why over 50% of U. S. cement plants use TDA



TDA

WHAT IS TDA?

TDA is a catalyst-dispersing-agent used as a grinding aid. Used in amounts of 1½ to 4 oz. per barrel of cement, it not only increases production, but its presence improves many of the important properties of concrete, such as durability, strength, and impermeability.

TDA is being increasingly used to keep down grinding costs. On the chart you can find the average production increase in finish grinding which operators are obtaining in actual mill grinds. Some use TDA for special fine grinds, and others use TDA when bottlenecks occur in the finish grinding departments. TDA is widely used in making high early strength cements. And many plants use TDA in all their cement.

TDA is *not* an air-entraining agent, but gives increased durability to concrete where freezing and thawing in the presence of calcium chloride is not a factor.

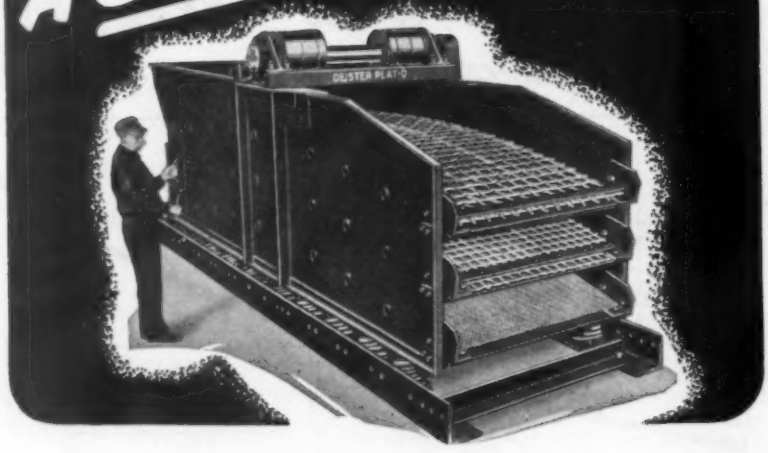
You can use TDA with confidence. It is approved for use in cement and has been field-tested in over one hundred million barrels of portland cement.

Our engineers will be glad to work with you in making trial runs in your own plant. Write to the Cement Division of the Dewey and Almy Chemical Company, 65 Whittemore Avenue, Cambridge 40, Massachusetts.

★ ★ ★

DEWEY AND ALMY CHEMICAL CO.
CAMBRIDGE 40, MASSACHUSETTS

A STANDOUT For Stamina



On the heavy-duty jobs . . . the jobs where the load keeps coming . . . the jobs where the screen must take a pounding hour after hour . . . the Plat-O Vibrating Screen has proved itself a *standout for stamina.*

In the Plat-O Screen, the emphasis is on rugged durability at every point of design and construction. Heavy steel framework and sides are of all-welded construction. Bearings, drive shaft and other parts which must take wear are oversize. There are no eccentrics and only two bearings (SKF Spherical Roller).

That's why, for the *punishing* jobs, more and more producers of aggregates and agricultural limestone are turning to Plat-O for *better sizing—cheaper.* That's also why it will pay you to ask Deister Machine Company engineers for the whole story on efficient and lower cost grading with Plat-O Vibrating Screens. Write today for complete information.

DEISTER MACHINE COMPANY

Fort Wayne 4, Indiana

PLAT-O by DEISTER

made to meet the needs of

ROCK PRODUCTS OPERATORS

- Made from selected steels
- Internally lubricated
- PREformed
- Made by craftsmen with years of experience

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FINANCIAL

PENNSYLVANIA-DIXIE CEMENT CORP., New York, N. Y., has announced that stockholders will vote December 3 on a recapitalization plan to be effected by a merger of Pennsylvania-Dixie and its wholly-owned subsidiary, General Cement Corporation. It is proposed that the new company have a single class of stock, $7 par, and that present preferred and common stock would be exchanged as follows: Four shares of new stock for each outstanding preferred share; one share of new stock and warrants to purchase two additional shares of new stock for each 10 outstanding common shares, scrip certificates being issued in lieu of fractional shares. Each warrant would entitle the holder to purchase new stock at $20 a share on and after June 1, 1946, up to May 31, 1949.

•

PENNSYLVANIA GLASS SAND CORP., Lewistown, Penn., has reported a net profit of $399,220 for the nine months ended September 30, 1945. This compares with $416,891 for the same period ended September 30, 1944.

•

PACIFIC COAST AGGREGATES, INC., San Francisco, Calif., showed the following earnings statement for the nine months ended September 30:

	1945	1044
Sales	$4,284,420	$4,423,747
Cost of sales	3,500,749	3,536,131
Selling, etc., exp.	433,253	364,567
Deprec. & deplet.	202,648	200,592
Operating profit	147,770	322,457
Other income, net	56,007	49,636
Total income	203,777	372,093
Fed. income tax	84,688	156,175
Net profit	119,089	215,918
Earn. com. share	$0.21	$0.38
No. of com. shares	555,934	555,947

•

MINNESOTA MINING & MANUFACTURING CO., St. Paul, Minn., announced that stockholders on November 5 approved a two for one split-up of outstanding 975,765 shares of no par common stock, of which 5,000,000 shares are authorized.

•

FLORIDA PORTLAND CEMENT CO., Chicago, Ill., with plant at Tampa, Fla., showed a net profit of $123,413 for the nine months ended September 30, 1945. This compares with $304,588 for a like period in 1944.

•

NATIONAL GYPSUM CO., Buffalo, N. Y., reported net sales of $6,285,350 for the three months ended September 30, 1945, as against $6,412,253 for the three months ended September 30, 1944. Net profit for the three months ended September 30, 1945, was $290,029 as compared with $219,684 for a like period in 1944.

The company announced that it had purchased the rock wool plant of the F. C. Brodie Co., in Mansfield, Mass., and assumed full control on October 22.

THE WARNER CO., Philadelphia, Penn., has registered 137,592 shares of common stock, $1 par value, with the Securities and Exchange Commission. The common stock will be offered in exchange for the company's outstanding 22,932 shares of 7 percent first preferred stock and accrued dividends on the basis of six shares of common for each preferred share. No exchange offer has been made to second preferred holders. Shares of common stock not taken in exchange by the first preferred stockholders will be purchased by the underwriters at a price to be supplied by amendment. Proceeds from the sale of stock will be used to retire the remaining unexchanged shares of first preferred stock. The cost of retiring all outstanding first preferred stock would be $1,939,129.

•

GYPSUM LIME & ALABASTINE, CANADA, LTD., Toronto, Ont., Canada, has placed in operation a new plant at New Westminster, B. C., to replace the old plant destroyed by fire in June. The plaster mill section has been in production for some time and the wall board and lath mill is expected to be in full production in November.

•

ALPHA PORTLAND CEMENT CO., Easton, Penn., showed the following statement for the 12 months ended September 30:

	1945	1944
Net sales	$5,924,308	$4,853,183
Oper. expenses	5,323,230	4,619,293
Deprec. & deplet.	514,347	461,386
Operating profit	86,731	d 227,495
Other income	130,852	144,573
Total income	217,583	d 82,922
Income charges	43,006	49,614
*Fed. income tax	46,952	.....
Net profit	127,626	d 132,537
Common divs	591,356	591,356
Def. for periods	†463,730	723,893

*No liability incurred for excess profits taxes.

†Before crediting $60,000 claim for refund of Federal income taxes based on carry-back of net loss for 1944.

•

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., reported a consolidated net profit, after Federal taxes, of $559,768 for the 12 months ended September 30, 1945, which compares with $709,961 for a similar period in 1944.

•

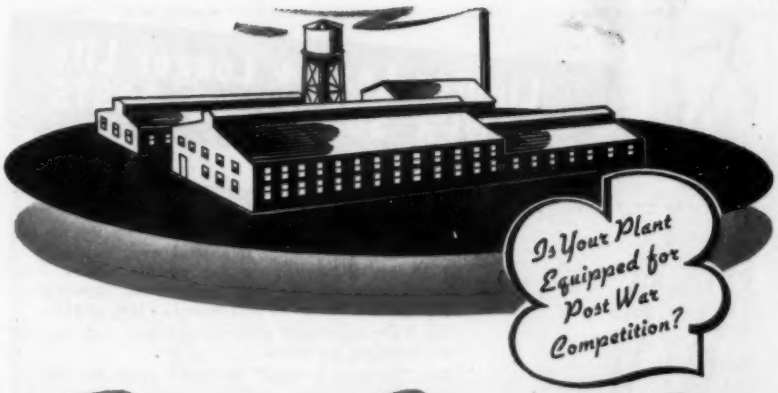
ARUNDEL CORPORATION, Baltimore, Md., had a net profit of $168,503 for the eight months ended August 31, 1945. This compares with $264,850 for a like period in 1944.

•

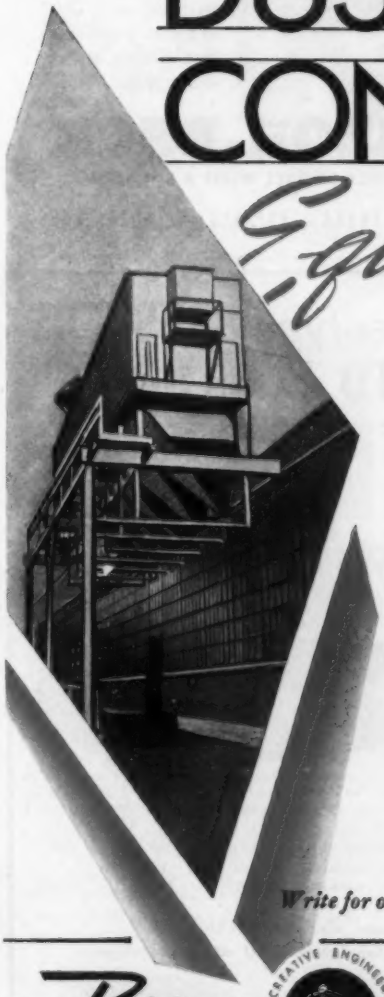
ALBERENE STONE CORPORATION OF VA., New York, N. Y., reported a net profit of $442,767 for the nine months ended September 30, 1945, as against $345,181 for a like period in 1944.

•

LONE STAR CEMENT CORPORATION, New York, N. Y., reported a net profit for nine months ended September 30, 1945, of $1,680,990, against $1,542,732 in a like period a year ago.



Parsons Oval Bag
DUST CONTROL Equipment



• SPEEDS UP PRODUCTION
• REDUCES MAINTENANCE
• INCREASES EFFICIENCY

To meet the keen competition of the post war period, far sighted executives are streamlining their factories for greater, more efficient production. Number one on their list is dirt and dust control. The answer is Parsons Oval Bag dust arrestors, backed by over 25 years of creative engineering and experience gained from installations everywhere. Dirt and dust are a menace to employees—slow down production . . . and deteriorate equipment. You can reclaim valuable dust, increase your production and employee efficiency with Parsons Oval Bag dust arrestors . . . our engineers will check your dust problem without obligation.

Write for our Bulletin . . . "Mastery of the Air"

Parsons CREATIVE ENGINEERS MANUFACTURERS ENGINEERING CORP.
2545 EAST 79th ST. CLEVELAND 4, OHIO

Lighter Load + Longer Life = LOWER SHOVELING COSTS

It's time to check the shovels you've been buying against the advantages of the modern RAZOR-BACK:

(1) The strongest light shovel ever made—of 13 ga. thickness up the middle where a shovel gets all its wear and strain, tapering to 17 ga. at the sides and with 11" long socket.

(2) Tubular shank with deep hang and perfect working balance.

(3) "Surface Peened" to stand more punishment, do more work.

Send for Catalog, Prices and Distributor's Name

THE UNION FORK & HOE CO.

642 Hocking St., Columbus 15, Ohio

SURFACE PEENED

"SURFACE PEENED"—Every shovel "cold-worked" following heat treatment,—tests 2½ to 5 times tougher than fine shovels merely heat treated.

RAZOR-BACK

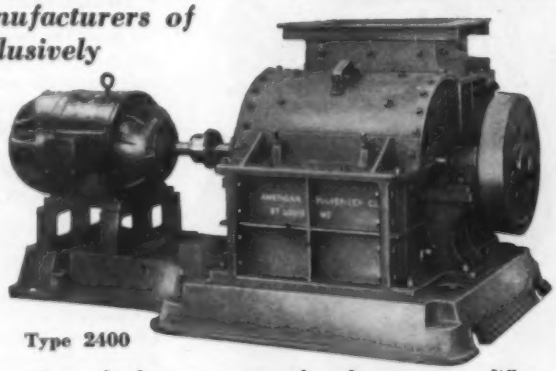
THE ONLY SHOVEL WITH A BACKBONE

ALSO STONE, BALLAST, INDUSTRIAL FORKS — ASPHALT AND ROAD RAKES

AMERICAN *Hammer type* CRUSHERS CUSTOM-BUILT TO FIT THE JOB

Built by manufacturers of crushers exclusively

- CAPACITIES AND TYPES FOR MANY OPERATIONS
- LOW OPERATING COST
- RESISTANT TO CLOGGING
- WIDE RANGE OF REDUCTION
- EASY ACCESSIBILITY
- SECTIONAL CONSTRUCTION FOR EASY REMOVAL



Type 2400

Just as hardness or wetness of product presents a different handling problem at each quarry and crushing plant—it presents a different crushing condition. That's why American offers different types and capacities to *fit particular jobs* rather than an "all-purpose" crusher. For roadstone or agstone, Americans have the easy adjustability, too.

Ask any of the many who operate Americans.

Complete information sent at your request

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1245 Macklind Avenue St. Louis 10, Missouri

OBITUARIES

ALBERT M. MEANOR, who some years ago founded the Valley Sand and Gravel Co., New Kensington, Penn., which was later sold to J. K. Davison & Bros., died recently at the age of 87.

•

GEORGE S. BARTLETT, widely known for his activity in the sale and promotion of concrete for roads, which won him the title "Apostle of Concrete," died October 21 at his home in Chicago, Ill., at the age of 87. Born in New York City in 1858, Mr. Bartlett started his career in 1879 with the Chicago & Northwestern Railway, Milwaukee, Wis. Five years later he became manager of the Milwaukee Cement Co. In 1905 he moved to Yankton, S. D., to take charge of the Western Portland Cement Co. where he remained until the operation suspended. Then he became affiliated with the Marquette Cement Manufacturing Co. in Chicago. In 1912 he joined the Universal Atlas Cement Co. at Chicago; was vice-president of the Edison Portland Cement Co., Orange, N. J., for three years, and returned to the Universal Atlas in 1916 where he served as special representative for 15 years. In 1931 he became assistant to the chairman of the board of directors of the Portland Cement Association, Chicago, Ill., which position he occupied until his death.

George S. Bartlett

As a mark of respect, his countless friends in the industry created the George S. Bartlett Award. The award is sponsored by the American Association of State Highway Officials, the American Road Builders Association and the Highway Research Board of the National Research Council, and

is awarded annually for individual outstanding contribution to highway progress.

•

BENJAMIN F. JACOBS, sales manager for the Eastern Magnesia Talc Co., Inc., Burlington, Vt., died September 5. He was 72 years old. Mr. Jacobs was for many years general manager of the talc company's plant in Rochester until it was damaged in the 1927 flood, after which he took the sales manager's position in Burlington which he held until the time of his death.

•

MRS. ANNA E. DALTON, widow of the late Jeremiah J. Dalton, who was treasurer of the Tyan Ready Mixed Concrete Co., Brooklyn, N. Y., passed away September 6. She was 60 years of age. Mrs. Dalton, who was secretary of the concrete firm at her husband's death last December, took over his duties as treasurer. She was a daughter of the late Nicholas Ryan, who founded the company.

•

PHILIP H. NOYES, engineer for Oliver United Filters, Inc., New York, N. Y., died recently in Chicago, Ill. He was 43 years old. Mr. Noyes joined the company in 1937 as technical filtration engineer in the western sales division at San Francisco, Calif., and for the past several years in the Chicago sales office.

•

ARTHUR E. STANGER, vice-president of The Whitehall Cement Manufacturing Co., Philadelphia, Penn., died recently at the age of 60. Mr. Stanger had been active in the cement industry all his life and had devoted much of his time working with the Philadelphia County Prison Inspectors Board, on which he served as a director.

•

JOHN D. CRONENWETH, chairman of the board of the Great Lakes Foundry Sand Co., Detroit, Mich., died October 14 following a short illness. He was 64 years of age. Mr. Cronenweth was a member of the National Industrial Sand Association, National Association of Manufacturers, American Foundrymen's Association, and Detroit Board of Commerce.

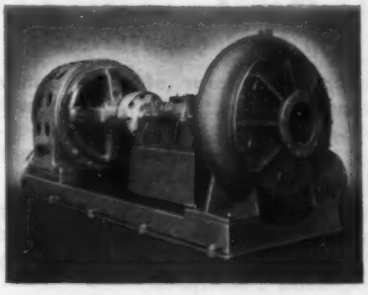
•

JOHN ARTHUR WENDT, sales manager for the United States Gypsum Co., Chicago, Ill., died October 19. He was 51 years old. Mr. Wendt is survived by his widow, Dorothy, and three sons, Alexander, Edmund, and Capt. John Wendt who is en route home from Tokyo.

•

CHARLES A. PORTER, former vice-president of the Lawrence Portland Cement Co., New York, N. Y., passed away October 13 at the age of 76. Mr. Porter started working for the company at an early age and in 1901 became vice-president and superintendent. In the same year he moved to Northampton, Penn., where he resided for 15 years, and then went to Allentown. At the time of his death he was living in Emmaus, Penn. Mr.

This **MORRIS**
HYDRAULIC CUTTER DREDGE
has proved its worth on
3 different deposits*
in 3 different locations...



Assembled, dismantled and moved overland 3 different times—for dredging jobs on 3 difficult deposits—the *Captain George*, a Morris 12" portable hydraulic cutter dredge has proved both its versatility and its mobility . . . demonstrating again that Morris dredges are engineered with two ends in view:—

1. MAXIMUM OUTPUT through getting the maximum amount of solids into the pump at a uniform rate.

2. MAXIMUM LIFE with a reasonable and economical wear of all parts.

Both require an efficient and correctly designed cutter operating at a proper speed, a properly laid out suction pipe arrangement, and an efficient dredge hoist that is simple in operation and capable of operating the cutter ladder and swinging the dredge quickly and accurately. The *Captain George* is an outstanding example of just such an efficient and well-balanced machine.

* 1. (near Chicago) production of heavy sand and gravel, delivering through approximately 1500′ of 12″ discharge line against a 30′ static discharge head. Used until deposit was exhausted.

2. (Mississippi River) dredging for locks and dams. Used until work was completed.

3. (Albert Lea, Minn.) A lake improvement project, moving 500,000 cu. yds. of mud, clay, sand and gravel through 12″ discharge lines up to 3500′ in length. Used for 7 months.

4. (Portland, Ore.) Now being set up for its fourth job.

Write for Special Bulletin **144** *giving specifications, cost-estimate data and recommendations on hydraulic dredging plants.*

MORRIS MACHINE WORKS
Baldwinsville, N. Y.
Branch Offices in Principal Cities

MORRIS **CENTRIFUGAL PUMPS**

OVER 25 YEARS A BUILDER OF BUCKETS

Thousands of these
ERIE 2-LINE CLAMSHELLS
serve today on All Fronts

● This Erie 2-Line Clamshell has been selected by the U.S. Army and Navy to serve on all fighting fronts. They combine block and tackle plus leverage to achieve the greatest digging force available in a clamshell design whether reeved 2, 3 or 4 parts of line.

Write for new bulletin to 7511 Geist Road.

ERIE STEEL CONSTRUCTION CO.
ERIE, PENNSYLVANIA
Aggre Meters • Buckets • Concrete Plants • Traveling Cranes

(Upper View) Sauerman Slackline Cableway moving gravel from wet pit to screening plant. (Lower View) Sauerman Scraper reclaiming crushed rock from stockpile.

SLASH COSTS
in moving materials

Ask any operator of a Sauerman Scraper or Cableway and he will tell you this is generally the cheapest way to handle pit and bank excavation and stockpiling.

These machines dig, haul and dump automatically in one operation and are adaptable to a great variety of ground conditions.

Operator has finger-tip control of the entire operation—power demand is moderate — repairs are few and simple.

Sauerman engineers will gladly study your digging or stockpiling problems. Their advice may save you money and will be given free. Write for our catalog and tell us about your problems.

SAUERMAN BROS., INC.
530 S. Clinton St., Chicago 7, Illinois

SAUERMAN
Long Range Machines

Porter retired from active business in 1930. He was founder of the Alliance Cement Block Co., Northampton, and was organizer of the sand pits at Palmerton. He directed the construction of the Lawrence Portland Cement Company's plant at Portland, Me.

●

JUDGE EDGAR WATKINS, well known counsellor to members of the lime industry in the southeastern section of the country, passed away on August 21 at his home in Atlanta, Ga. His wide experience in the practice of law and his earlier connection with the Interstate Commerce Commission and other government activities made his advice particularly valuable on the many rules and regulations of the wartime agencies.

●

EVAN JOHN ROBERTS, superintendent of the Stephens Jackson Slate Co., Pen Argyl, Penn., until his retirement in 1929, passed away recently at the age of 79. Mr. Roberts was born in Edmonton, England, and came to Pen Argyl with his parents 62 years ago. He was engaged in the slate business during his entire career.

●

JOHN X. FARRER, assistant secretary and advertising manager, The Jeffrey Manufacturing Co., Columbus, Ohio, died unexpectedly on October 11, at Columbus, Ohio. Mr. Farrer was 56 years old and had been with the company for 32 years.

●

ROBERT ATKINSON, district manager of the Steel and Tube Division of The Timken Roller Bearing Co., Detroit, Mich., since 1927, died recently at the age of 53.

●

W. P. MCCREADY, general superintendent of the Mathieson Alkali Works, Inc., Saltville, Va., passed away recently after 30 years of service with the company.

●

ARTHUR E. QUERE, Cleveland, Ohio, sales agent for the Hendrick Manufacturing Co., Carbondale, Penn., in the states of Ohio, Kentucky and Indiana, died recently.

●

J. FRANK DETRICK, superintendent of the Rimer, Ohio, plant of the National Lime and Stone Co., Findlay, Ohio, died recently.

●

THEODORE A. SENN, sales manager of the grindstone department of the Cleveland Quarries Co., Cleveland, Ohio, died August 14. He was 70 years of age and had completed 50 years in the sandstone busineess, beginning in 1895 with the old Cleveland Stone Co., predecessor of the present firm.

●

LLOYD SUMNER BURDICK, district representative for Caterpillar Tractor Co. in North Dakota, Montana, Alberta and Saskatchewan, was killed recently when two sections of the Great Northern's transcontinental train, the Empire Builder, collided at Michigan, N. D.

New Incorporations

Mill Valley Washed Sand & Stone Corp., Muskego, Wis., has been organized to excavate, crush, grade and wash sand, also to deal in all cement material and concrete products, with a capital of 200 shares of stock at $100 per share. Incorporators are R. C. Preston, E. F. Preston and M. S. Preston.

Waylite Concrete Masonry Co., Racine, Wis., has been incorporated to deal in cement, concrete, goods, wares and merchandise of all kinds, with a capital of 245 shares of pfd. stock at $100 ea. and 1000 shares of common stock at $1 ea. Incorporators are Ida L. Knorr, Emil Hellesen and Burt Johnson. Correspondent is Nelson, Boodell & Grant, 105 S. LaSalle St., Chicago 3, Ill.

Curran & Kileen Co., Wautoma, Wis., has received a charter to deal in limestone and agricultural lime, with a capital of 300 shares of stock at $100 ea. Incorporators are Thos. J. Curran, Earl F. Kileen and H. N. Haferbrecker. Correspondent is Kileen & Kileen, Wautoma, Wis.

Renton Concrete Products Co., Renton, Wash., has filed incorporation papers with a capital of $10,000. T. M. Royce, 1801 Smith Tower, Seattle, Wash., is the lawyer. Incorporators are A. J. McMillan, Seattle; Charles R. Hudson, Renton; and Craig Travis, Seattle.

Norell Granite Co., Inc., Barre, Vt., has filed certificate of incorporation with a capital of 60 shares of common stock, par value $100 per share. Signers of the certificate are Edwin B. Jackson, president, and Margaret Jackson, clerk.

Dubuque Ready-Mix Concrete Co., Dubuque, Iowa, has been organized for the purposes of making and selling ready-mix concrete, concrete blocks, and all other cement or concrete products and the making, processing, buying, and selling of any and all types of building and construction materials, tools, machinery equipment, and products. Authorized capital stock is listed as $80,000, consisting of 800 shares of common stock with a par value of $100 each. Officers of the company are G. D. Rose, president; Bart L. Molo, vice-president; Harold E. Molo, secretary, and Paul M. Nauman, treasurer.

Manufacturers' News

The Dow Chemical Co., Midland, Mich., announces that Leland I. Doan, who has been general sales manager for the past 16 years, now assumes the position of director of sales. Mr. Doan has been a vice-president of the company since 1936 and secretary since 1941. He also holds several offices and directorships in various Dow subsidiaries. Donald Williams has been appointed general sales manager, and Donald K. Ballman has been made assistant general sales manager.

Insley Mfg. Co., Indianapolis, Ind., has appointed Louis R. Russell as chief engineer of the company's crane and shovel division, in charge of research, design and development of present and future models. Mr. Russell's appointment will permit Frederick B. Ray, chief engineer of the concrete equipment division and a specialist in that line during his 25 years with the company, to devote all his time to research and development in the field of concrete equipment.

The Neff & Fry Co., Camden, Ohio, announces that Lee Longacher has joined the company as sales manager of the industrial bin division.

The McGann Mfg. Co., Inc., York, Penn., has announced a change in ownership and management. Clyde H. owner; Mrs. Catherine J. Smith, vice-president and assistant treasurer, and J. E. Schmidt, secretary and controller.

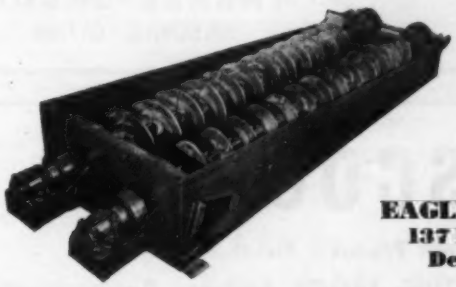
"Our Material Now Passes U.S. Government and State of Kansas Specifications"!

Before installing an Eagle Screw Washer, the Walters Sand Company, Manhattan, Kansas, experienced difficulty meeting specifications because of the presence of dirt and clay in the material they were shipping. An Eagle Washer solved the problem, as it has for so many operators, large and small.

They reported, *"After installation of the Eagle Washer, our sand and gravel had a cleaner texture. Prospective customers became actual customers. From our point of view, this washer is a complete success. We find the upkeep comparatively small, as there are no expensive parts to replace in this washer's construction."*

Interchangeable wear-resistant screw flights, Timken roller thrust bearings at the top and composition marine-type bearings at the bottom, and "rising current" wash water inlets are reasons why Eagles stand up under continuous service and do a thorough washing job.

The hundreds of Eagle Screw and Log Type Washers, Classifiers and Dehydrators in use by successful operators speak for themselves. Plan now for the postwar demand for clean sand and gravel—send for Catalog 44.



Let an Eagle "feather your nest!"

EAGLE IRON WORKS
137 Holcomb Avenue
Des Moines, Iowa

EAGLE *Specialized Sand and Gravel Equipment*
"SWINTEK" DREDGE LADDERS — SCREW WASHERS
LOG WASHERS — DEHYDRATORS — SAND TANKS
CLASSIFIERS — REVOLVING SCREENS

EAGLE IRON WORKS
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"SERVING INDUSTRY FOR OVER SEVENTY YEARS"

PULVERIZERS

Hundreds of Installations . . Use Bradley Pulverizers

for the reduction of

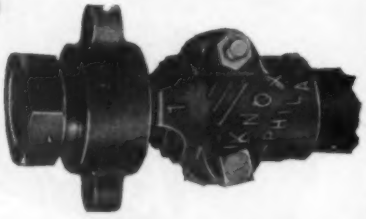
AGRICULTURAL LIMESTONE
Cement Materials and all
Dry, Non-Metallic Minerals

CAPACITIES: 1 TO 50 TONS PER HOUR
FINENESSES: 20 TO 350 MESH

BRADLEY PULVERIZER CO.

ALLENTOWN, PENNA.

Male or Female Threads



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Valves-Couplings-Nipples-Clamps-Menders

Recognized Universally as the ULTIMATE in Valves and Couplings

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FARREL-BACON

CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants.

Engineering Service

FARREL-BACON
ANSONIA, CONN.

A SCOOP

in the Rock Products Field!

"OPERATING TRENDS Analyzed Geographically"

• Shows locations of deposits. • Lists production problems under new rigid specifications. • Gives solutions of leading producers to these problems.

Articles Appear Monthly in . . . **ROCK PRODUCTS**

R. G. LeTourneau, Inc., Peoria, Ill., is planning to establish a branch factory in England. Brig. W. E. R. Blood, in charge of the British Army Engineers' headquarters at Washington, D. C., is managing director designate of the new branch. Maurice Foote, promoted from superintendent of Plant No. 1 at Peoria, Ill., will be plant manager of the British factory. He will leave for England soon. Denn M. Burgess, executive vice-president, is now in England to select the necessary plant properties.

Lima Locomotive Works, Inc., Lima, Ohio, announces the appointment of four new distributors for Lima shovels, draglines and cranes: Construction Equipment Corp., Long Island City, N. Y., covering southeastern New York, Long Island, and Staten Island; Bill Goodwin Machinery Co., San Antonio, Texas, covering extreme southern Texas; Reid-Holcomb Co., Indianapolis, Ind., covering all of Indiana except a few counties in southeastern and northwestern Indiana; Southern Iron & Equipment Co., P. O. Box 2029, Atlanta, Ga., covering northwestern Georgia.

Link-Belt Co., Chicago, Ill., has announced that Lt. Col. B. M. Prestholt has been presented the Chinese Grand Star of Honor medal for outstanding and distinguished service rendered by him to the Republic of China and to the Chinese Army. Lt. Col. Prestholt was employed as an engineer-designer at the Caldwell plant of the company prior to entering the service in November, 1940.

American Foundry Equipment Co., Mishawaka, Ind., has announced the appointment of Morton I. Dorfan as manager of the dust and fume engineering division. In this position he will supervise and coordinate the company's expanded dust control sales, engineering and research activities.

The Cooper Alloy Foundry Co., Hillside, N. J., has formed a new division by the name of Certified Alloy Valve Co., which will specialize in the manufacture of stainless steel valves for which it will furnish a certified analysis of every part which comes in contact with liquid. P. C. Shaffer is chief engineer of this new division.

Food Machinery Corp., San Jose, Calif., has named A. F. McGraw director of sales with headquarters in San Jose, Calif. Mr. McGraw has had 32 years' experience in the farm implement field. He was recently general sales manager of the Allis-Chalmers tractor division, Milwaukee, Wis.

St. Regis Paper Co., bag division, has opened a new office in Detroit, Mich., to better serve customers in the Michigan territory. C. E. (Andy) Anderson is in charge of the office.

Hewitt Rubber Corp., Buffalo, N. Y., has purchased a large plant adjacent to the company's headquarters on Kensington Ave., in Buffalo, N. Y., to provide additional space for the manufacture of new peacetime products and for expansion of its present line of industrial rubber items.

E. I. duPont de Nemours & Co., Wilmington, Del., has announced the retirement of F. T. Beers, manager of the Du Pont, Wash., commercial explosives since 1923. Mr. Beers is 70 years of age and has stayed at his post five years beyond retirement age because of the Government's need for experienced men in war production. R. F. Boltz, manager of the Alabama Ordnance Works, succeeds Mr. Beers. E. R. Wright, manager of the Birmingham, Ala., works, has retired and A. S. Albright, manager of the Louviers, Col., plant, succeeds him at Birmingham. P. S. Cushing, manager of the Wabash River Ordnance Works, Terre Haute, Ind., succeeds Mr. Albright at Louviers. A. A. Smith, III, assistant manager of Wabash, assumes charge of the plant. A. W. Skerry, who has been on special assignment in Wilmington in connection with Government work, becomes manager of the Senaca, Ill., plant.

O. S. Delancey becomes assistant manager at Senaca. R. P. Kelly becomes assistant manager of the Birmingham works, succeeding W. D. Garwood, who has been appointed special assistant to the director of production of the explosives division at Wilmington. J. J. McIntyre, manager of the Gopher Ordnance Works at Rosemont, Minn., becomes manager of the Alabama Ordnance Works, and E. W. Hutchinson, assistant manager of Gopher, assumes charge there.

Cummins Engine Co., Inc., Columbus, Ind., has reorganized its sales department, creating two new sales divisions. Norman E. Palmer has been appointed general sales manager to work directly with Paris E. Letsinger, vice-president in charge of distribution. J. D. Allen becomes sales manager of dealer organizations, and Fred W. Sparks becomes sales manager of manufacturing accounts. Mr. Palmer has been the Washington, D. C., representative for the past three years. Prior to that he was a member of the New York Regional Office sales staff. He is a graduate engineer, with an M.E. degree from Purdue University. Mr. Allen has been with the company since 1938, serving in various departments. For the past year and a half he has been assistant sales manager. Mr. Sparks formerly was manager of the Cleveland Regional Office. Prior to that, he was a sales engineer in the office at Columbus, Ind.

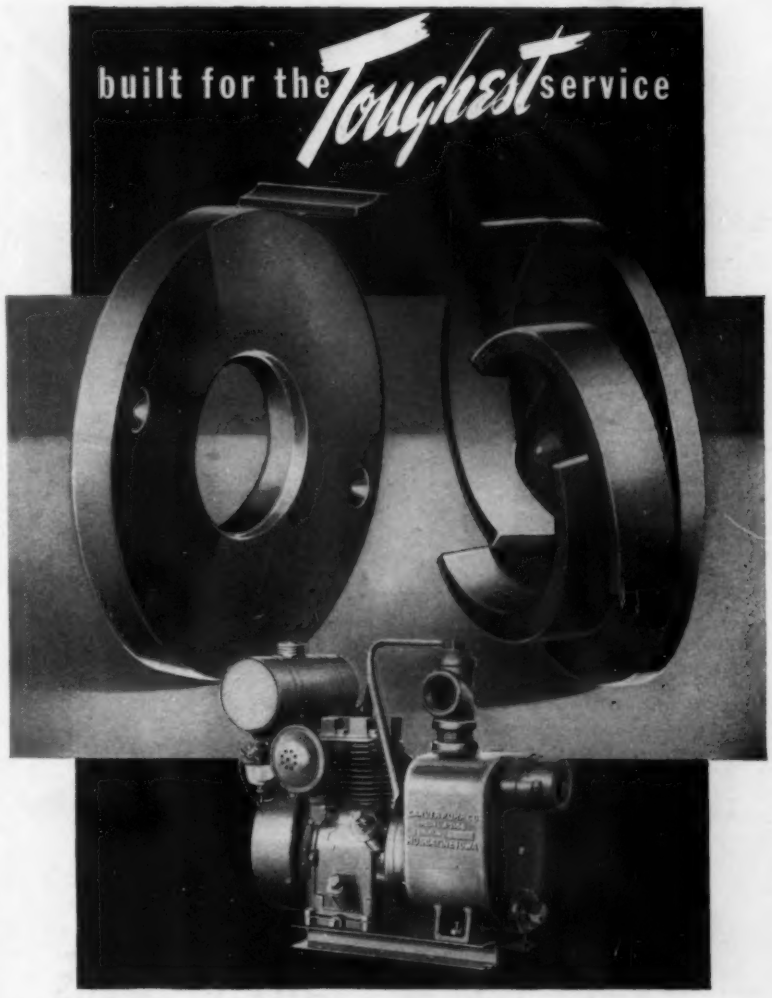
Norman E. Palmer

Hewitt Rubber Corp., Buffalo, N. Y., has announced through Thomas Robins, Jr., president, that the company has acquired a controlling interest in Robins Conveyors, Inc., Passaic, N. J. In addition to directing the management of Hewitt since 1936, Mr. Robins has been chairman of the Robins Conveyors executive committee for the past five years. A new office has been opened in Charleston, W. Va., which will be the headquarters of R. U. Jackson of the Robins division, Nelson J. Reinhold, who has joined Hewitt after serving 14 years with Cincinnati Rubber Co., and H. N. Kepler, sales engineer formerly in the Washington office.

Chicago Pneumatic Tool Co., New York, N. Y., has promoted Guy J. Coffey from manager of the Los Angeles district office, a post he has held since 1939, to vice-president in charge of sales. Mr. Coffey was selected for this position as a result of his successful record of selling and sales management during his 12 years with the company, which he joined in 1933 as a salesman in the Philadelphia branch. Subsequently he was advanced to the Cleveland office, and finally to manager of the West Coast office. Starting as a beginner with the Ohio Steel Foundry Co., Lima, Ohio, Mr. Coffey was advanced to chief electrician. In 1919 he became plant engineer of the Detroit Steel Casting Co., a position he held for 11 years, when he resigned to become special sales engineer of the Black & Decker Mfg. Co. in 1930.

Guy J. Coffey

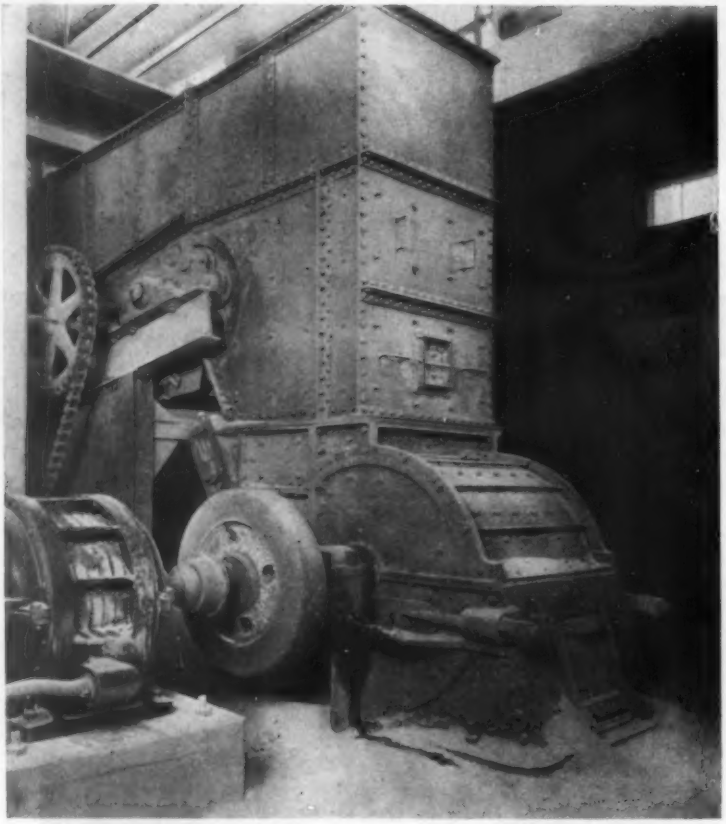
Macwhyte Co., Kenosha, Wis., has elected R. P. Tyler a director of the company, to fill the vacancy caused by the resignation of Mrs. George S. Whyte. Mr. Tyler is also general sales manager



● Every feature of Carver Pumps is designed to withstand the toughest operating conditions. Impellers are scientifically designed with web-reinforced vanes confining wear to one side. Renewable liners carry a cast lug protecting the scroll casing at the impeller cut-off where wear is greatest. Both parts are cast from special alloy and ground to close tolerance to keep performance high. When wear eventually occurs, their quick, low-cost replacement makes the pump as good as new.

THE CARVER PUMP CO.
Muscatine, Iowa

CARVER CENTRIFUGAL Certified PUMPS



A **DIXIE** HAMMERMILL WILL FILL YOUR CRUSHING NEEDS

Pictured above is a Dixie Non-Clog Hammermill fed by a 2½-yard power shovel at 250 tons per hour. It crushes run-of-quarry stone to a uniform product in a continuous, trouble-free operation.

10 or 1000 TONS PER HOUR

All Dixie Hammermills are made to order—tailor-made for the job at your particular plant. They are made in 14 sizes and embody such advanced hammermill design as the Non-Clog Moving Breaker Plate and Adjustable Feed End, both exclusive Dixie features.

If you want economical, uniform production; if you have special feeding problems due to clayey or gummy materials . . . GET THE FACTS ABOUT DIXIE NON-CLOG HAMMERMILLS.

Write for Data

DIXIE MACHINERY MFG. CO.

4119 GOODFELLOW BLVD. • ST. LOUIS, MO.

Nordberg Mfg. Co., Milwaukee, Wis., announces that A. C. Colby, for 17 years representative of the crusher division in New York, has resigned to enter another field. R. R. Shafter, who is vice-president and general manager of the process machinery division, has in addition been appointed eastern manager of the crusher division, with headquarters for both divisions at 60 E. 42nd St., New York, N. Y. Jack Bond has been transferred from the Washington office to New York and will cover the eastern territory as sales engineer for both process machinery and crusher divisions.

Fairbanks, Morse & Co., Chicago, Ill., announces the election of Charles H. Morse III as vice-president of the company. Mr. Morse will be in charge of research patents, traffic, western pump division, and the Inland Utilities Co., a subsidiary. His headquarters will be in Chicago. Mr. Morse started with the company as a factory worker in the Three Rivers, Mich., plant soon after his discharge from World War I. After seven years of intensive training in various departments, he was promoted to manager of the Memphis sub-branch. In 1935 he was elected president of the Inland Utilities Co. He is a son of Col. Robert H. Morse, president, and a brother of Robert H. Morse, Jr., vice-president and general sales manager.

Chas. H. Morse III

Barber-Greene Co., Aurora, Ill., has appointed the following distributors: Miller Equipment Co., Grand Rapids, Mich., serving the lower peninsula of Michigan west of and including the counties of Emmet, Charlevoix, Antrim, Kalkaska, Missaukee, Clare, Isabella, Montcalm, Ionia, Eaton, Calhoun and Branch, but excluding Berrien county; Phillippi-Murphy Equipment Co., Minneapolis, Minn., the northeast portion of Minnesota being served by T. T. Murphy and S. J. Phillipi of the Minneapolis office, and the entire state of South Dakota being served by the branch office of Phillippi-Murphy Equipment So., Sioux Falls, S. D., where Joseph E. Hexamer is general manager.

Electric Machinery Mfg. Co., Minneapolis, Minn., announces the appointment of James De Kiep as chief engineer in charge of electrical and mechanical design and development.

The Osgood Co., and **The General Excavator Co.**, Marion, Ohio, have appointed R. S. (Jack) Rheay division sales manager for southeastern United States, with headquarters in Atlanta, Ga.

Claude B. Schneible Co., Detroit, Mich. C. C. Hermann, general manager, announces severance of relations with the company. After a short rest at his summer home, Mr. Hermann will enter the field of consulting mechanical engineering specializing on foundry design and dust control.

Joshua Hendy Iron Works, Sunnyvale, Calif., announces that E. G. Cross has been appointed supervisor of the production planning and control department of the Crocker-Wheeler Division at Ampere, N. J.

Insley Mfg. Corp., Indianapolis, Inc., has appointed Donald A. Koehler commodity director, a newly-created post, whereby he will be responsible for coordination of procurement and production schedules.

Mack Trucks, Inc., New York, N. Y., has appointed Captain Ralph L. Tompkins, recently transferred to inactive duty in the Marine Corps, as manager of the White Plains, N. Y., branch.

ROCK PRODUCTS'

CONCRETE PRODUCTS

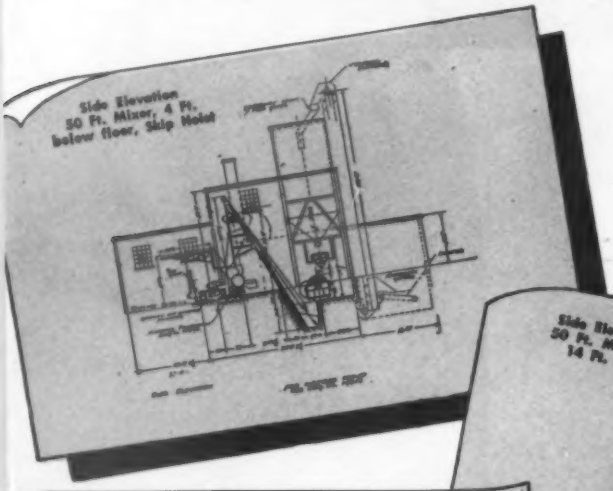
and Cement Products

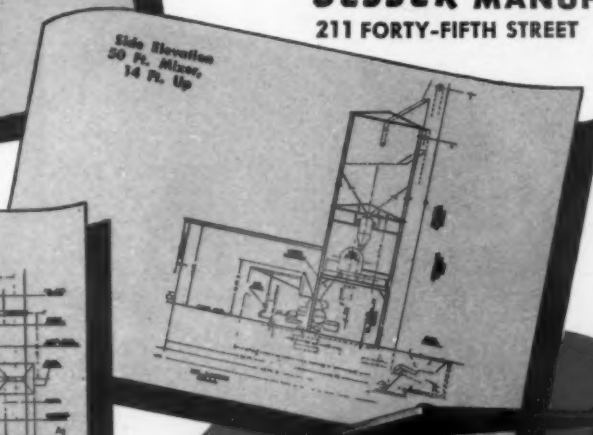
NOVEMBER
1945

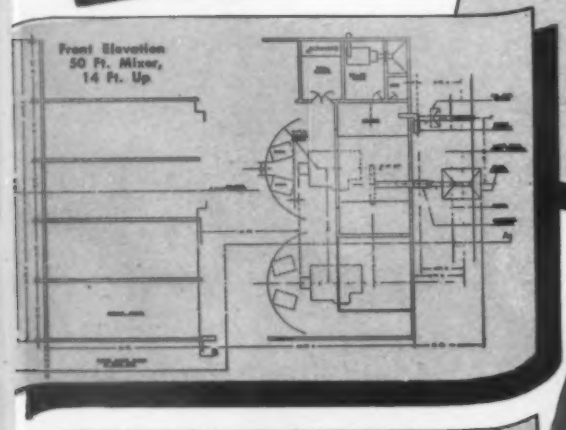
● Installation of large concrete pipe in the Pacific Northwest.

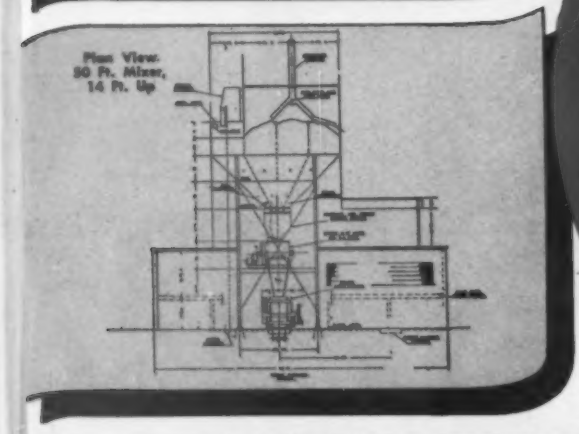
ANOTHER BESSER *First!*

Plant Layout Engineering Service









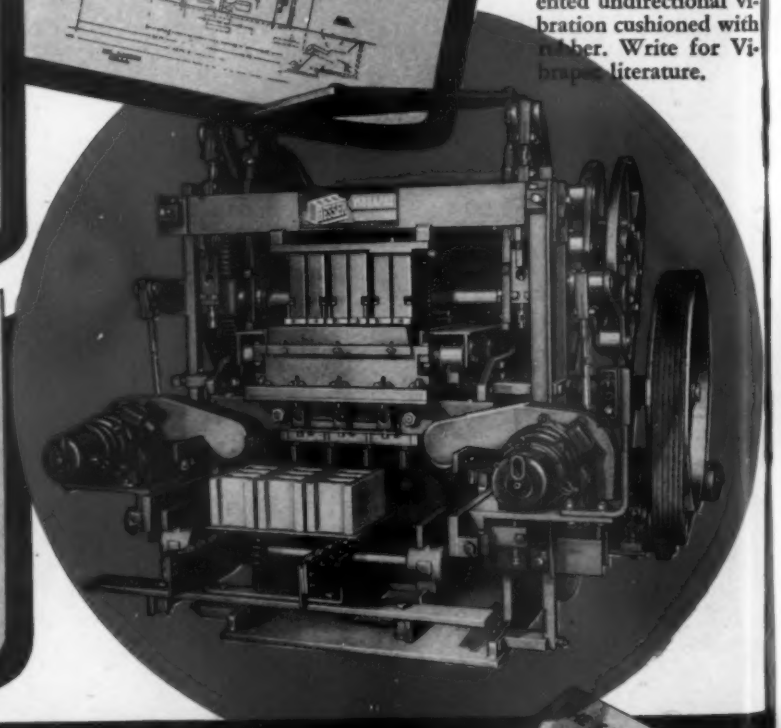
Every concrete masonry plant is DIFFERENT! The location of the plant, its layout, facilities, etc., must be properly planned, in order to be both efficient and profitable. That's where experienced BESSER Engineers come in as a "FIRST". For Plant Design Engineering has been a special BESSER service for more than twenty years.

If you have a plant layout problem, regardless of size, call in a BESSER engineer. He will gladly consult with you and give you the benefit of his broad experience in this field.

BESSER MANUFACTURING CO.
211 FORTY-FIFTH STREET • ALPENA, MICH.

BESSER Super Automatic Plain Pallet Vibrapac

Automatically turns out 600 — 8" x 8" x 16" blocks per hour—three at a time. All sizes and shapes of blocks made on one set of plain pallets. Density and texture controlled by patented undirectional vibration cushioned with rubber. Write for Vibrapac literature.



ADVERTISING Keeps Tile Machines Busy

Concrete Products and Roofing Co., manufactures five types of concrete tile, meter boxes, fence posts, ornamental boxes, and many other specialties

By H. E. SWANSON

The official family. Left to right: Thornton Estes, treasurer; Ellen Dougherty, secretary; F. G. Smithson, president; and R. N. Hawkins, vice-president

MANUFACTURERS of cast stone products for the past 33 years, the Concrete Products and Roofing Co., Birmingham, Ala., is now busily engaged in manufacturing concrete roofing tile and meter boxes in addition to many miscellaneous precast concrete units. Five different styles of roofing tile are made, with colors added integrally while the tile is in a plastic state. Other items produced are concrete steps, coping, ornamental flower boxes, flower pots, fence posts, ornamental benches, steps, highway markers, and bird baths.

The five types of tile made are English, Spanish, Mission, Walter Concretile, and Waterseal. This company exploits the inherent advantages of concrete roofing tile over clay tile, including the elimination of warpage, possibility of more intense coloring in the finished tile, the absence of discoloration due to absorption of moisture and dust, and longer life.

Art concrete meter boxes, which have been adopted as standard in the southeastern States, the Pacific Coast and the Hawaiian Islands, are also produced on a license arrangement. These boxes have reinforced concrete covers and concrete or metal reading lids.

Sand and Superock lightweight aggregates are shipped to the plant by rail and dumped into covered stockpiles adjacent to the plant. After mixing in a 1-cu. yd. Blystone mixer, the concrete is taken to forms by manually-operated carts. The steel forms are coated with paraffin oil prior to placement of the concrete to permit easier stripping.

Roofing tile are made on a battery of five Crawfordsville Machinery Co. tile machines. Color is sifted over the top of the wet concrete and trowelled. The mineral coloring material is ground at the plant in a color mill, with a ratio of 25 lb. of coloring to one sack of cement. Finished tile are placed on wooden racks with a capacity of 450 units each, and moved to a storage shed by manually-oper-

Illustration shows three pages from attractive booklet advertising various types of tile and typical structures roofed with concrete tile

Outside display yard showing the great variety of concrete products. To the left may be noted concrete upright sections of lawn or park bench, ornamental urns and boxes, bird baths and electric meter boxes which are made in large volume; to the right may be seen one display of concrete tile, a flower box, and concrete steps

Making tile on one of a battery of five machines. Note racks for curing in the background

ated lift trucks. Curing is facilitated by the application of water twice daily for a period of 10 days. Capacity is 400 tile per day for each machine.

For lightness in weight, Superock and sand in equal proportions are used in the manufacture of meter boxes. These units are cast in steel forms and are also cured for a period of ten days with a daily application of water. About 75 boxes can be produced daily. Other products, such as ornamental lawn furniture and fence posts, are made as demand dictates, and a supply is maintained in anticipation of this demand.

Local deliveries are made by a 1½-ton company-owned Chevrolet truck. Deliveries outside the city are handled by contract haulers. Shipments of tile and meter boxes have been made as far as Waco, Texas.

In addition to newspaper advertising and distribution of pamphlets, the company carries spot announcements on a local radio station advertising its products.

F. G. Smithson is president of the Concrete Products and Roofing Co.; R. N. Hawkins is vice-president; Thornton Estes is treasurer; and Miss Ellen Dougherty is secretary.

Seattle Products Meeting

MEMBERS of the Concrete Pipe and Products Association held a meeting in Seattle, Wash., September 22 which was devoted to matters of organization business, short addresses on the problems of returning veterans and safety and accident prevention, discussion of production problems and investigation into new uses for concrete products.

An especially interesting forum was conducted on the problems of plant experience with admixtures. Those who reported favorable results declared the admixes made a better-appearing product, avoided excessive breakage, and made form stripping easier as well as providing a degree of waterproofness. Experience had not been extensive enough to warrant a general recommendation either for or against the use of admixes.

Engineer-Manager C. M. Howard reported on extensive field trips and urged the development of new markets and uses for concrete products particularly in the farm market which he believed, "looms especially favorable."

The complete panel of officers was returned for another year, including: President, Fred M. Kettenring, Graystone Concrete Products Co., Seattle, Wash.; vice-president, J. R. Sherman, Yakima Cement Products Co., Yakima, Wash., and secretary-treasurer, W. S. Wilson, Graystone Materials Co., Olympia, Wash.

Going Into Block Business

JANESVILLE SAND AND GRAVEL CO., Janesville, Wis., will build a concrete block plant this winter, and will have a Stearns Joltcrete to produce concrete masonry units for local sale. The plant will be built in a part of the sand and gravel pit which has been depleted.

Sell Lumber and Block

WM. J. ABRAHAM & SONS, Seymour, Ind., has purchased the Hamer Concrete Block Co., plant which has been modernized with new machinery.

Front row, left to right: A. W. Burchill, H. Henry, Mark Dwight, T. P. Nash, R. E. Lind, E. G. Lowry, F. C. Strange, W. S. Wilson, Ralph Goodrick, H. J. Moyer, R. M. Gilmore, George Wagenman. Standing, left to right: F. M. Kettenring, H. E. Bergren, F. J. Barrett, J. R. Sherman, Lars Anderson, R. W. Condon, C. M. Howard, Ralph Metzger, Earl Bracken, R. H. Young, W. F. Paddock

Loading block from outside storage along side of paved driveway from plant

Double Block Capacity

Shute Concrete Products Co., Richmond, Ind., constructing new curing facilities, and adding block machine, traveling batcher and bins

By R. S. TORGERSON

ANTICIPATING a boom in the construction industry, the Shute Concrete Products Co., Richmond, Ind., has taken steps to double concrete block production in a plant which was built within the past year. Demand is so heavy today that it is difficult to maintain any stockpiles, and with Richmond's diversified industry bursting at the seams with plans for expansion it is confidently believed that a continually rising market for concrete masonry units for housing and factory installations will continue for years to come.

Separate Curing Rooms

At the present time, a No. 9 Stearns Joltcrete permits a capacity of 4000 standard 8- x 8- x 16-in. masonry units or equivalent per day, but a new No. 9 Joltcrete now on order will double this production. The company will soon have a Duntile drain tile machine in operation. Both sand and gravel concrete and Celocrete lightweight concrete masonry units are produced, in 4-, 8- and 12-in. sizes.

Curing rooms now provide a capacity for curing 4000 block per day, but additional facilities will be built to take care of the production of the second No. 9 Joltcrete on order. The block manufacturing plant is constructed of concrete masonry units, and the curing rooms also are built of concrete block. Curing rooms are built adjacent to the block plant as separate integral units at right angles to a line from the machine to the yard. A paved driveway is provided from the curing rooms to the storage yard. This paved driveway is sufficiently large so that it is used for outside storage of empty concrete block racks.

Curing rooms built of concrete block have a reinforced concrete roof with the walls built up at the sides to form an open top box within which 5 in. of dry Celocrete will be placed as insulation. The roof will be given a slight slope and openings arranged for drainage. Fans at one end will exhaust steam from the curing rooms.

There are now two acres of ground for plant and storage facilities, but within six months this will be expanded so that up to 100,000 block may be stockpiled with ample room for truck driveways.

Traveling Weigh Beam Batcher

At present, sand and gravel aggregates are received by truck from the nearby American Aggregates Corporation plant and dumped to a stockpile adjacent to the plant. However, there is now under construction a belt bucket elevator which will elevate aggregates into a 100-ton capacity wood bin partitioned for two sizes of Celocrete or sand and gravel aggregates for making the two kinds of block. There will be a three-beam traveling weigh batcher to serve the two No. 9 Joltcrete machines. Bulk cement storage facilities also will be provided.

The single No. 9 Joltcrete machine now is served by a 28-cu. ft. Stearns mixer located at the floor level, the mix being elevated by skip to the hopper feeding the block machine. Block are quickly handled by pneumatically operated off-bearer to Chase steel racks standing on steel turntables in front of the block machines. The turntables facilitate loading either side of racks without using the Crescent gas-electric lift truck, which has a smooth, powerful pick-up due to its direct-current motor drive. A Barrett-Cravens hand lift truck also is employed.

Two International trucks are operated by the company to make deliveries, a 1½-ton and a one-ton unit. Truck hauling also is hired to take care of the heavy demands until such

(Continued on page 134)

Left: View of new plant with enclosed bin storage section in the center, above; curing rooms under construction, and paved driveway to outside storage. Right: One of the two block machines. Note pneumatically-operated off-bearer and pallet cleaner in the background

CONTINUOUS MIXING
In the Concrete Block Industry

CONTINUOUS concrete mixers for cement block making have been used considerably in the Detroit area and should be considered in determining the mixing method for the eventual mass production of concrete products.

A survey of present installations was made to determine if possible what progress is being made and how the users of continuous mixing machines feel about their performance.

By definition a continuous process is one in which one pound of product is removed from a system for every pound of raw materials added during the same period of time. This implies not only continuity of material flow but also postulates the condition that only a small portion of material, at any given stage of finishing, is present at any instant. The accurate proportioning of aggregate, cement, and water in small increments is therefore the key to the success of continuous concrete mixers.

Two makes and modifications were found in the area: the Kent mill and the Eberling mill. While the two differ in the mechanical design of the proportioning mechanism, the fundamental principles are the same in that both depend on volumetric measurement.

The Eberling feeder consists of an octagon drum about 6 in. in diameter and revolving slowly on its axis, located at the bottom of the hopper. A snug fitting jacket made of rubber belting encloses the barrel and is the element responsible for the satisfactory operation of the feeder. As any given face of the barrel passes through the hopper zone the pressure of the column of aggregate or cement in the hopper above, keeps the rubber jacket flattened against it, but as soon as the face in question passes outside of the hopper beyond the gate, the natural tendency of the jacket to form a cylinder, exerts itself, resulting in a clean breakoff of feed layer. In the illustration the hopper gate is adjusted to the desired gap. Each hopper in the Eberling machine has its independent feeder.

The Kent machine has a reciprocating plate under the hopper for feeding. Both the cement and aggregate hoppers are operated by the same plate, making it possible to change the total rate of feed without disturbing the aggregate: cement ratio.

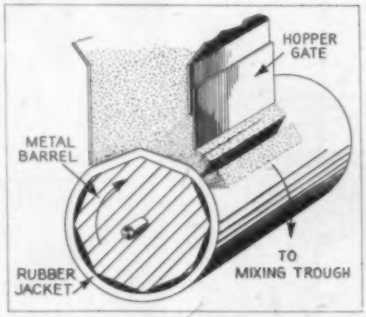
Both the Kent and Eberling machines deliver their charge into a horizontal trough equipped with a slowly revolving paddle shaft. Working lengths of from 6 to 10 ft. have been found sufficient for thorough mixing, as field tests have borne this out.

Water is controlled manually with a valve in the supply line and is added at a point where the sand and cement have already been partially dry-mixed. The concrete must still be tested by hand for proper consistency. This is done at the discharge point of the mixing trough. An inclined belt with cleats carries the mix up to the feeder of the block machine.

A variation of a Kent installation designed by The Sampson Block Co., Detroit, Mich., makes use of large bulk bins. Cement and aggregate are thus added by the truckload, entailing a substantial labor saving. The original reciprocating feeder is retained for the aggregate which flows into the Kent hopper direct by gravity. Since the size of the cement bin made it impracticable to feed the cement into the continuous machine by gravity, however, Sampson designed a special feeder. This consists of a slow speed horizontal 9-in. Link-Belt cement screw running from the bin to a discharge point over the mixing trough. A Reeves Vari-belt drive is used to adjust the rate of cement flow wanted. This plant is remarkable for its success in eliminating costly superstructure.

Standard Building Products Co., also of Detroit, and using an Eberling mill, have added the feature of continuity to the removal of freshly-made imperfect block from their Besser Vibrapac. A horizontal 24-in. belt conveyor is installed beneath the off-bearer platform, and is long enough to discharge the bats into the boot of a bucket elevator which returns them to the top of the machine for recharging. In order to obtain clearance for the belt the block machine had to be set on a raised base. That extra installation cost has been repaid many times by the ease with which broken block have been disposed of. This operator points to the fact that he only needs one 5-hp. motor to mix a sufficient quantity of concrete for a production of 4800 8- x 8- x 16-in. block per day.

An operation producing 1000 8- x 8- x 16-in. block per day claims an operating expense reduction of $8 per shift since installation of a Kent mill. The aggregate and cement hoppers over the mixing trough are filled manually. All equipment is on one floor. Future plans for expansion of production call for another Kent mill for a second block machine, set up as a twin to the unit now in service.



Section view showing type of feeder used in continuous concrete mixing in one concrete products plant

Concrete Pipe Publicity

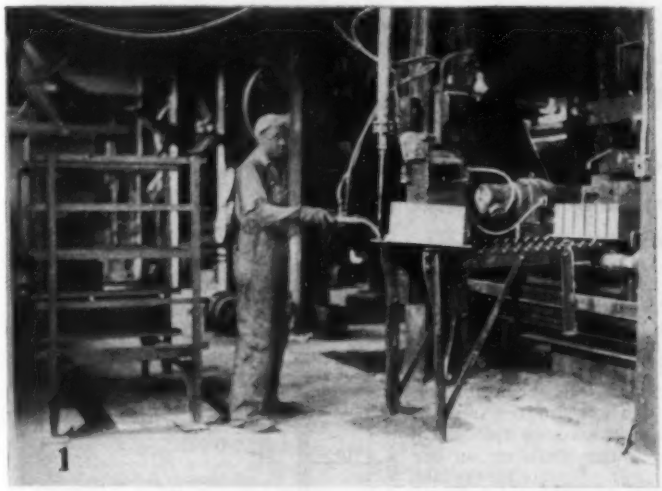
ON the Concrete Products section inside cover of this issue is an illustration which appeared on a publicity release of the Concrete Pipe and Products Association with headquarters in Seattle, Wash. This live-wire regional organization has been very active in promoting concrete pipe and concrete products. Each one of these releases has an illustration of some outstanding job, usually in color, and a reference by number to a story about the project which is prepared separately. The illustration, however, has a box giving the names and addresses of all members of the association.

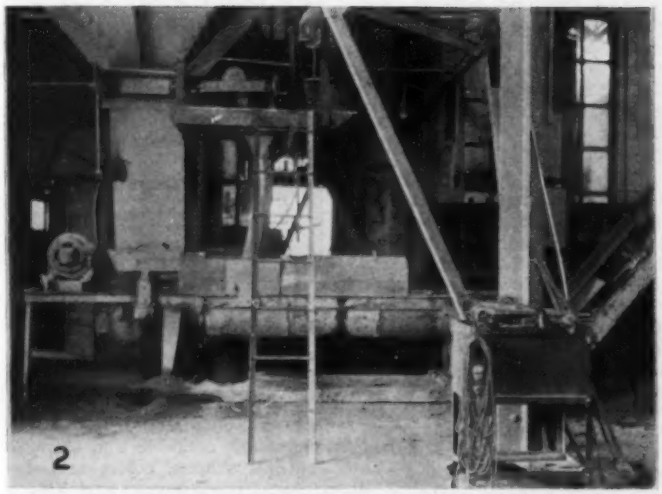
To Make Masonry Units

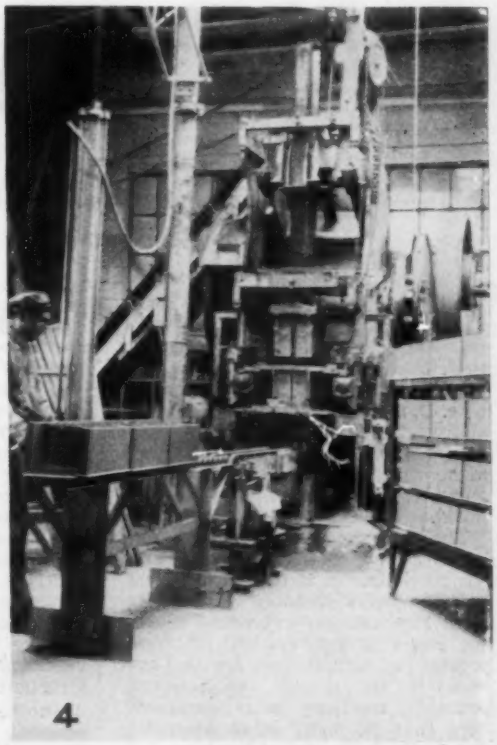
THE F. HURLBUT CO., Green Bay, Wis., plans to complete its new plant for the production of concrete block about December 1. Modern machinery and facilities for 24-hr. cycle curing are being installed. A lightweight slag aggregate will be used.

Sell Vault Business

M. A. LACOURT, Janesville, Wis., concrete burial vault manufacturer, has sold his business to Walter Jaeger. The new owner is the operator of a truck line in Janesville.







Views showing various applications of continuous concrete mixing. 1—Front view of block machine showing belt conveyor underneath for removal of freshly made imperfect block. 2—Large capacity aggregate bin at upper left. Variable speed drive in upper center regulates the speed of the cement screw visible in the background. 3—Continuous mixer installation in a small plant. Notice sand and cement hoppers which are hand loaded. 4—Cleated belt conveyor brings concrete from mixer trough to block machine in background. 5—Discharge end of mixing trough of continuous mixer

Concrete Product Developments in Palestine

Some interesting floor, roof and wall construction designs are used in this ancient country

PALESTINE is very much in the headlines these days with reports of political turmoil, but very little has been said about the progress in industry, construction, and manufacture. Dams, irrigation systems, power plants, agricultural expansion, and many manufacturing plants have made this ancient country take on many of the aspects of the western world.

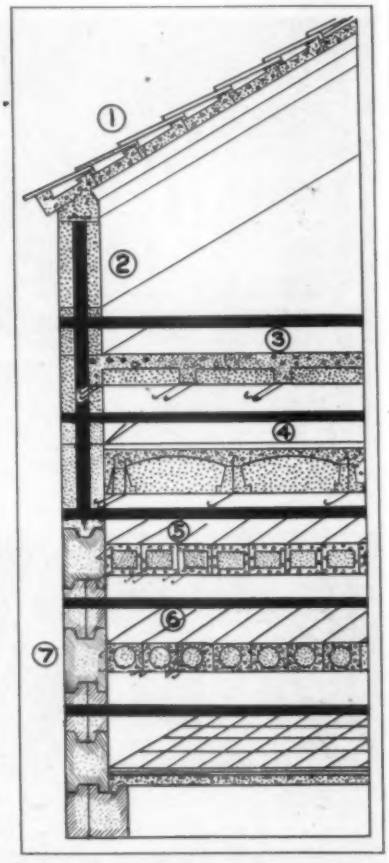
The government of Palestine has issued a trade catalog covering various developments in the country, and Part V covers Building and Structural Engineering, embracing nearly 400 pages of information. Concrete products of various types are used extensively throughout the country, probably receiving more emphasis here than in many other countries due to the high cost of lumber.

One of the larger concrete products manufacturers is Sippona Engineering & Trading Co., Ltd., at Haifa and Tel-Aviv. This company makes what has been called the Sippona floor or roof slabs, installation details of which are shown herewith. This construction consists essentially of individual beams made up on the building site from concrete blocks laid end to end, presenting a continuous dovetailed groove top and bottom. These grooves are reinforced with one mild steel bar each and filled with concrete, thus joining the units into a single beam. According to the method of reinforcing, Sippona beams may be used for simply supported, cantilever or continuous slab construction.

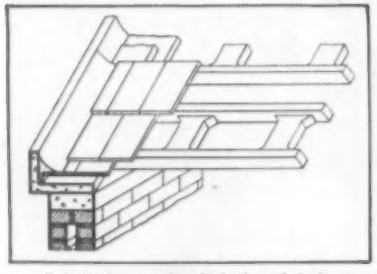
Another company making a precast concrete construction (shown in the illustration) is the Kheymar Yakhin-Misrad Kablani Works, Ltd. Small village bungalows are made with walls of concrete slabs, 4 cm. thick, with inner columns covered with 5 cm. thick wood-concrete slabs. Wood-concrete is made of compressed chemically processed wood shavings and portland cement. This company also manufactures concrete pipe by three methods: tamped; vibrated; and pipes of the preceding two types with a centrifugally applied lining of bitumen-plast, as it is called.

Mozaica A. Wolfman, Ltd., Haifa, produces concrete and terrazzo floor tiles, concrete roofing tiles, and paving flags and curb stones. Other specialties include concrete and terrazzo steps of all shapes, colors and designs; sills, fence posts, and also a complete line of wall and partition block. One of its features is a patented pitched roof design, using concrete products.

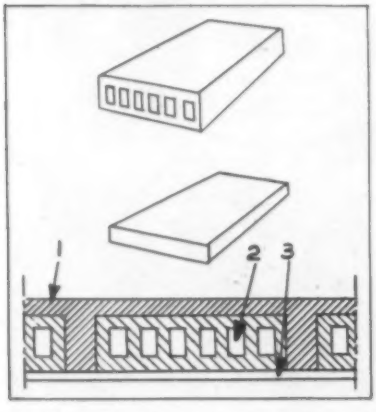
(Continued on page 133)



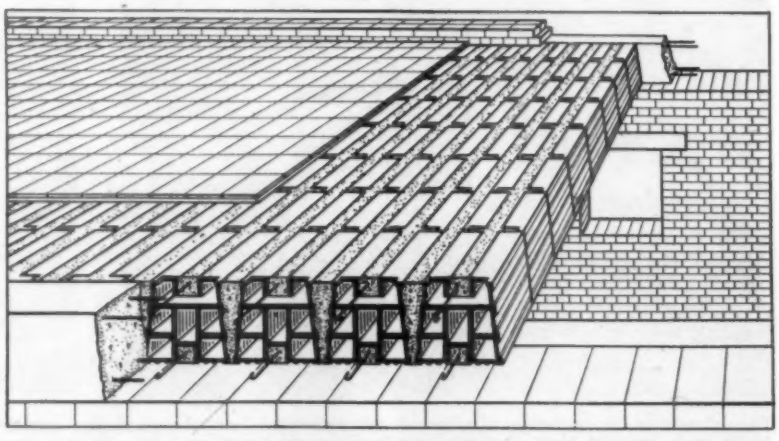
Complete concrete house construction manufactured by one company



Patented concrete pitched roof design



Wood-concrete slabs used for thermal insulation of outer walls; for use as a plaster base for ceilings under pitched roofs, and as filler for ribbed concrete slabs



Sippona floor and roof system consists essentially of individual beams made up on the building site from concrete block laid end to end

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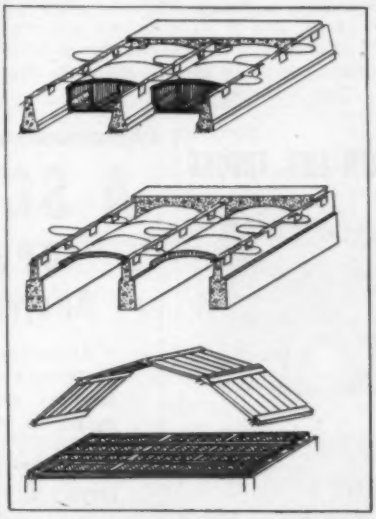
ROCK PRODUCTS

Concrete Roofs

(Continued from page 132)

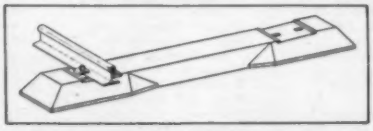
Silical Building Products, Ltd., Tel-Aviv, has designed a complete concrete house construction, details of which are shown in the cross-section elevation. A steam-cured, "cellular" concrete is used. Precast floor beams are up to 10 meters in length or about 38 ft. long.

Solel Boneh, Ltd., Haifa, has developed three roof and floor designs



Three roof and floor designs of precast concrete

of precast concrete. The hollow block roofing consists of precast, prestressed reinforced concrete beams; hollow concrete blocks placed between the beams; and a concrete slab cast in place covering both beams and blocks, as shown in the illustration. An arched slab flooring has been designed for wider spans and higher live loads, differing from the hollow-block type in that these blocks are replaced by solid arched concrete slabs. Instead of using precast arched

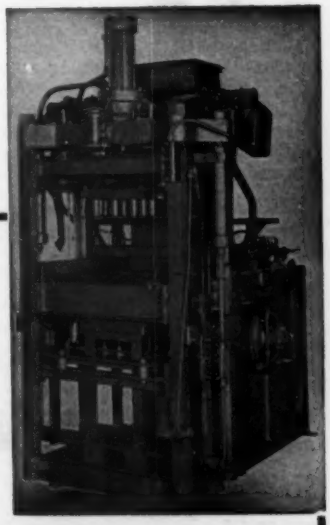


Prestressed concrete railway tie

slabs, the arches may be cast in place by the use of sheet metal forming.

Roofing Design

A slab roofing design comprises prefabricated prestressed slabs, made up of hollow bricks surrounded by a prestressed concrete frame, placed side by side. The only pouring of concrete on the site is the filling of the grooves between the slabs with cement mortar, the shape of the grooves being such as to insure the combined action of adjoining slabs. This company also makes concrete railway ties. These units have prestressed reinforcing, and are equipped with rail fastening plates cast in place.



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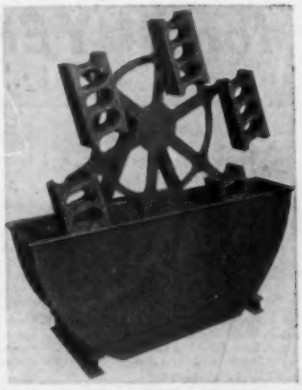

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The KENT MACHINE CO.
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Dissolve Partnership

CLARENCE CLINE and RUSSELL HENDRICKSON, partners doing business under the name of Randall Concrete Products Co., Randall, Minn., have dissolved their partnership by mutual agreement. Russell Hendrickson will continue the business under the old name.

Making Block

THE MISSOURI RIVER SAND AND GRAVEL CO., Boonville, Mo., is now making concrete block with new machinery and curing facilities. A large outside storage area also is available.

Enlarge Brick Factory

PIEDMONT DUNBRICK CO., INC., Charlotte, N. C., has started work on a plant for the manufacture of concrete brick, according to Claude Fisher of Waynesville, N. C., president. Temporary offices are at 2133 South Boulevard in Charlotte.

Adds Curing Facilities

THE CONCRETE PRODUCTS CO., 30 Fairview ave., Falmouth, Mass., is installing a Besser Vibrapac block machine, and is building two low pressure curing rooms, one 26- x 56 ft., and one 14- x 56- ft. Albert L. Bowman is the owner.

Curing Block

(Continued from page 129)

time as new equipment can be obtained.

A well-equipped shop is maintained for all except heavy overhaul jobs. Both types of welding are employed, electric and acetylene. The acetylene unit is a Smith Life Time machine, and the electric welder is a Superior Machine Co. unit. Bench grinders and other small tools are available to make repairs.

Officers of the company are Frank Oates, president; Norman Shute, vice-president. Russell White is foreman and Glenn Niewoehner is office manager.

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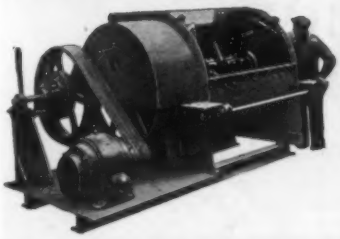

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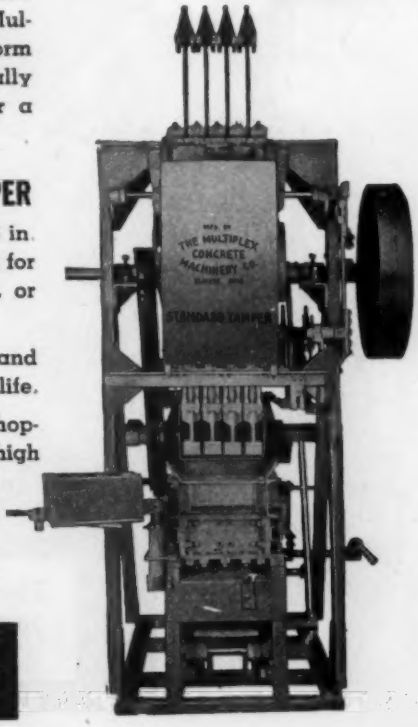

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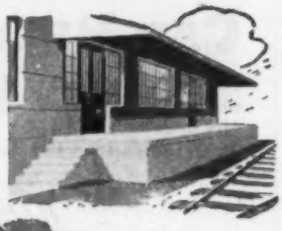

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The wide adaptability of concrete enables you to satisfy promptly all your customers' needs for home, industrial, commercial or farm construction in one widely available material.

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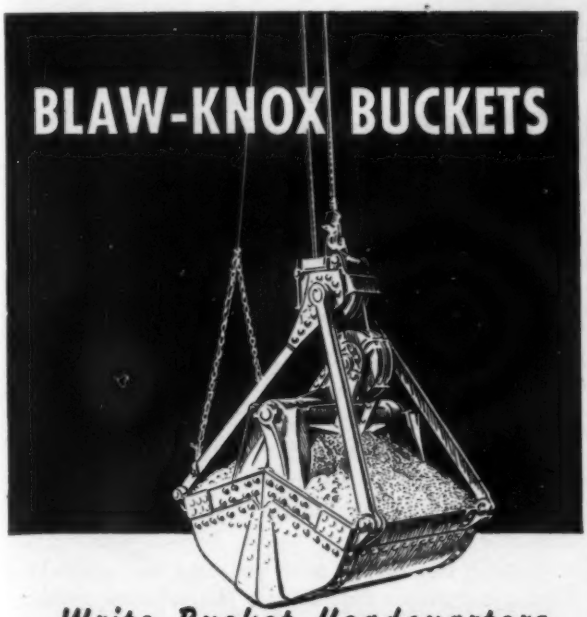

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THE above picture shows a rear view of the new model NEW LEADER marl and lime spreader. This spreader is equipped with an extra wide conveyor and two distributor discs and is strictly a one-man spreader. You will be able to haul wet lime or marl and, due to the large opening in the back end of the spreader, material will always feed onto the distributor disc evenly.

This spreader has many outstanding features. Both gear boxes driving the distributor discs are equipped with cut steel gears and ball-bearings running in a dust-proof and oil-tight gear case. The large gear box driving the wide chain conveyor is equipped with a steel ring gear and pinion and a thrust bearing also running in a dust-proof and oil-tight gear case. Bearing hangers are placed underneath the distributor discs; these are also equipped with ball bearings. This helps to carry the weight of the distributor discs and the load, the weight not being suspended from the gears in the small gear box. With this arrangement you are assured longer lived gears. The framework of the spreader is of hardwood.

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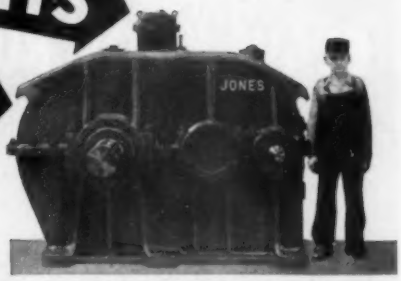

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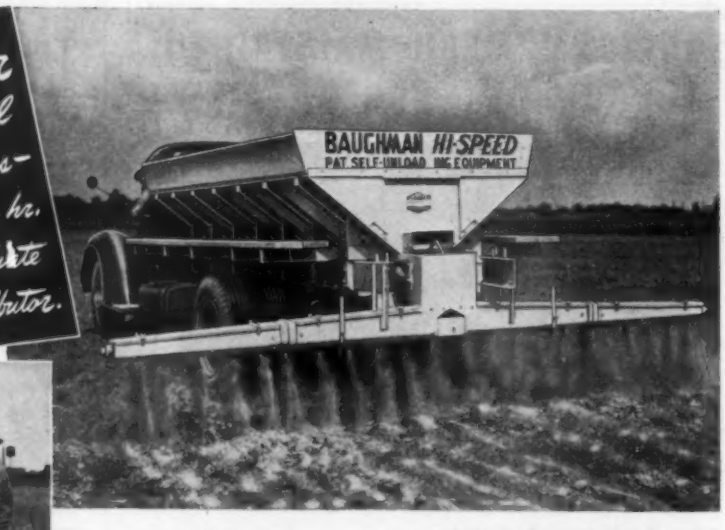

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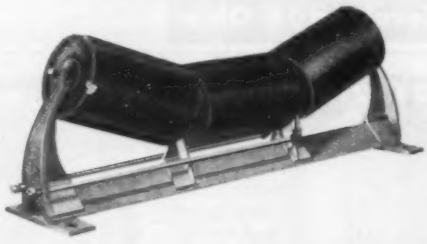

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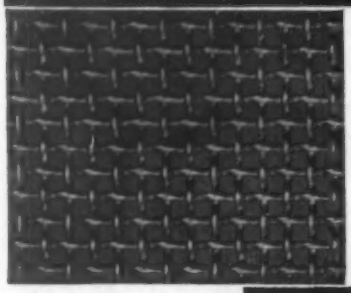

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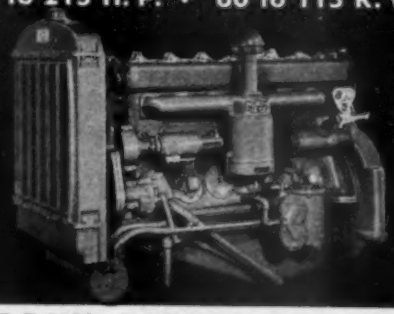

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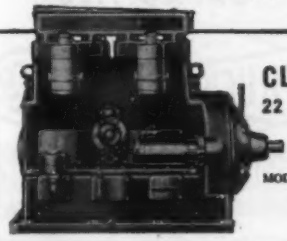

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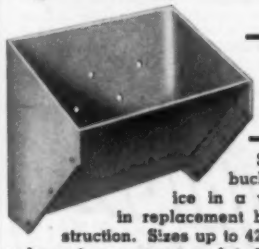

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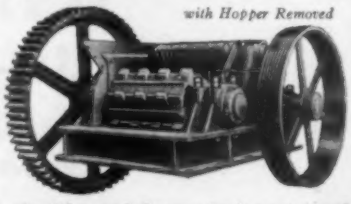

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Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. 1,000 cu. ft.

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1—Buchanan jaw crusher, size 10x16".
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1—Acme jaw crusher, Ser. No. 1686, size 9x16".
1—No. 3 Champion jaw crusher, size 7½x13".
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WAGON DRILLS

2—Gardner Denver derrick drills with Model 21 Gardner Denver drill; will drill 30 ft.
1—Ingersoll Rand drill, size D, with utility air hoist andIngersoll Rand X71 drill.
1—Ingersoll Rand Model FM-2 drill, with Ingersoll Rand air hoist, size X71 drill, mounted on pneumatic tires; will handle 20 ft. steels.
2—Ingersoll Rand, Model FM-2, with air hoist and IX71 drill, mounted on 3 steel wheels; will handle 20 ft. steels.
1—Ingersoll Rand drill No. 3122, with X71 drill, mounted on 4-wheel trucks; will drill up to 36 ft. deep holes.

We Also Have a Large Stock of Drill Steel with Miscellaneous Timken Bits

PUMPS

We have a large stock of centrifugal pumps, gas and elect. powered, from 1½" to 10". Also Dredging pumps.

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All this equipment is owned by us and may be inspected at one of our plants.

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EQUIPMENT CORPORATION of AMERICA

LOCOMOTIVES

1—80 ton Baldwin 0-6-0 separate tender switcher, built 1925, A.S.M.E. boiler, piston valves, Walschaerts valve gear, overhauled and up to date on all I.C.C. requirements.

1—79 ton American 0-6-0 separate tender switcher, built 1930, superheated boiler, piston valves, Walschaerts valve gear, rebuilt and up to date on all I.C.C. requirements.

1—26 ton American 0-4-0 saddle tank, standard gauge, A.S.M.E. boiler, entire new firebox, completely overhauled, coal burner.

1—20 ton Whitcomb diesel-mechanical 36" gauge locomotive, four wheel type. This locomotive built in 1936 and has had only light service. It is completely rebuilt with new wheels, chains, sprockets, reversing gear, and improved type bronze clutch plates. Caterpillar V-8 engine, 4 speeds each way, link-and-pin couplers.

1—Westinghouse 10½" locomotive type cross-compound air compressor, rebuilt, suitable for either locomotive or stationary installation.

Birmingham Rail & Locomotive Co.
BIRMINGHAM 1, ALABAMA

LISTER DIESEL GENERATOR SET

30 H. P., Type 27/3, with direct connected 22½ KVA. A.C. Generator, Exciter and Automatic Voltage Regulator.
Tested — Guaranteed — Ready

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Guaranteed used Steel Pipe and Boiler Tubes
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Buildings, Valves and Fittings
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2—315 cu. ft. 100 lb. pres. Ingersoll-Rand, Models 315 and 315A portable Air Compressors with 105 HP Waukesha Oil Engines, complete with accessories.

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Besser Model D-8 parts for sale. New Star cams and other parts rebuilt and never used.

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Diesel Power Unit
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Dual mold block machine makes approximately 10 block per minute. One 8", one 12" with 2300-8", 3700-12", 4000-3⅝" commercial cored pallets in good condition. Price $4500. F.O.B. LaCrosse, Wis.

STRONG BLOCK COMPANY
LaCrosse, Wisconsin

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GYRATORY: 42" Gates K, 20" Superior McCully (like new). 20" Superior McCully Gates Nos. 12, 10, 9, 8, 7½, 6, 5, 4, 3, 2, 1 (75 avail.). Telsmith Nos. 4, 5, 6, 8C, 9 & 16. Also many Austins, Kennedys and Traylors, many sizes.
JAW TYPE: Traylor 60x84, 48x60, 42x48, 24x72. Superior 84x66 & 24x36. Buchanan 30x42. Farrel 60x42, 30x36, 24x36, 18x36, 12x24. Good Roads 1030. Acme 24x40. Misc. 7x12, 9x16, 8x20, 8x24, 12x24, 9x36, 15x36.
REDUC. TYPE: Kennedy Nos. 25, 37 & 49. Telsmith 3-F & 40. Traylor 30" TZ, 8", 10", 12". Super. Mec'ully 6"x10" Newhouse 5, 7, & 10". Symons Cone & Disc Ty. 3' to 4'.
ROLLS: Allis-C. 12'x12, 36x10, 40x15, 54x24 & 72x30. Fairmount 36x60 & Jeffrey 24x24 to 36x54 single roll. Cornish 36x14 & 42x16. Etc.
HAMMERMILLS: Williams No. 1, 2, 3, 4, 5, & 6. Jeffrey 36x18 & 36x42. Day Nos. 20 & 40. Etc.
MILLS: Kennedy Ball 4x8, 5x6 & 5x8. Marcy 5x6 & 10x9. Hardinge 6'x3', 2'x30' & 6'x9'. Misc. Tube Mills 5' & 6'x22'. Sturtevant Ring Roll, Raymonds, Kents, Fuller Lehigh, Etc.
CRUSHING PLANTS: No. 45 Diamond No. 22 Pioneer 8x24, 10x30 Good Roads, 9x40 Austin-Western, 9x36 C.R.

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Barges, Bins, Buckets, Boilers, Cableways, Cars, Compressors, Conveyors, Cranes, Dryer, Derricks, Elevators, Excavators, Generators, Hoists, Kilns, Draglines, Drag Scrapers, Dredges, Drills, Engines, Locomotives, Loaders, Motors, Pipe, Pumps, Rail, Scales, Screens, Stacklines, Shovels, Tanks, Trucks, Tractors, Etc., in many sizes, types and makes at low prices. (I have equipment at many points in the United States and Canada. What you need may be near your plant.)

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One (1) No. 101-A Stover Lime Pulverizer with ¼" screens and 7 sets of spacers from ⅝" to 2". Used a few weeks only, as good as new. Price $200.00.

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Bloomfield, Indiana

Electric Shovels—3 & 4 yd., corner Cats.
1—2½ yd. Diesel Cat. Drag.; 3 yd. Walker.
2—1½ yd. Shovels & Drags., new '37 & '38.
1—1¼ yd. shovel, equipt. with 1¼ yd. dip.
1—NW 105 Crane-Drag., 50' bm. & Extensions.
Cat. D-6 Tractor & LeTourneau Angledozer.
18x24 C-R port. jaw crusher & elevator.
18x24 & 40x42 Rolls, C-R, Dia., & Traylor.
Steel Sectional Barge, 18'x35'x3'.
150 HP Elec. Scraper Hoist; 75 HP 3 drum.
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FOR SALE

MOTOR, 75 HP 900 RPM GE Slip Ring 440/-3/60.
HYDRATOR, Clyde No. 2, 10 foot.
HAMMERMILL PULVERIZER, K-B size 1, 12" x 24".
TRACK SCALE with Streeter-Amet weight recorder, 12,000 lbs. capacity.
GRINDING MILL, Fuller-Lehigh Air Swept 32", with blowers, cyclone collector and piping.
VIBRATING SCREEN, Kennedy-Van Saun Type A, four deck, 4' x 8'.
G. & W. H. CORSON, INC.
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Here are some of the many outstanding Consolidated Machinery Buys available for Immediate Shipment. When you call on Consolidated you are sure of getting A-1 machinery.

TRUCK CRANE

1—18 ton Truck Crane, mounted on 8-14:00x20 pneumatic tires, Model 255-A, P. & H., equipped with Waukesha Type MZR gasoline engine, 55' steel boom, hydraulic controls. Lifting capacity 18 tons. Manufactured by Harnischfeger Corp., new in 1941. USED FOUR MOUNTHS ON ONE JOB. With this Crane we can also include a crawler mounting with which this crane was originally furnished.

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1—1 yd. P. & H. Model 600-A Shovel, gasoline, fitted with new crawler treads.

GOOD USED EQUIPMENT—QUICK SHIPMENT
RAYMOND PULVERIZERS

2—4 roll Raymond High Side Pulverizers, each equipped with air classifier, one of the "whizzer" type; Raymond exhauster, cyclone collector and inter-connecting piping. For products as fine as 99.9%—325 mesh, with coarser adjustments.

2—No. 0 Beater type—equipped as above—but including automatic throwout attachments and motors.

5—Nos. 3, 1, 00 and 0000—Beater types.

2—No. 70 "Imp" Coal Pulverizers; also No. 45, No. 55 and two Bowl Mills.

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1—Komarek-Greaves, two rolls, 32" dia. x 24" face, with extra shafts and rolls. Rated on coal—25 t.p.h.

CRUSHING ROLLS

1—24"x40" Penna. Crusher Co. Single Roll, also 24"x24" Jeffrey, 24x28" Mead-Morrison, 36"x60" Fairmount—all single roll.

2—36"x16" Allis-Chalmers Type "B" double roll, also 24x14", 42x16" and 54x20" A-C.

DIRECT HEAT ROTARY DRYERS

2—4'x30' American Process, ¾"- shells, excellent condition. Now at Anniston, Ala., and must be removed and shipped quickly. Priced accordingly.

1—5x30' Cummer, mounted on I-beam frame, with furnace, etc.

2—6'x30' Ruggles-Coles, ⅜" shells, for single or double shell operation.

JAW CRUSHERS

1—9"x15" Allis-Chalmers, Blake type.
1—18x36" Farrel-Bacon, Type B.
2—24x36" Traylor, Type A.
1—30x42" Farrel-Bacon, Type B.
1—22x50" Champion.
1—36x54" Buchanan.

HARDINGE CONICAL MILLS

4—6'x22", 6'x36" and two 8'x30" Pebble Mills, all silex lined, continuous.
1—5'x22" Ball Mill, iron lined.
1—6'x12' Rod Mill, straight side, iron lined.

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5—30", 5', 6', 8' and 14' dia.
1—14' dia. Sturtevant.
1—Model BX-100 Sutton, Steel & Steel Table.

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1—Battery of two 3'x5' Tyler Hummers, Type No. 31, TRIPLE DECK, with gen. set.
1—Battery two Tylers, No. 33, single deck.
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15-16-17 PARK ROW — NEW YORK, N. Y.
Shops and Yard at Newark, N. J., cover eight acres.

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Steel Storage Tanks

6,000 — 8,000 — 10,000
Gallon Capacity

Reconditioned, Tested and Painted

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45,000 HORSE POWER FOR YOUR SELECTION
MODERN — IMMEDIATE DELIVERY

Complete Plants—10,800 Horsepower Busch-Sulzer—9,000 KVA—6 Units
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PORTABLE POWER UNITS
International Harvester Caterpillar Cummins Buda
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Shops and Warehouse: Jersey City, N. J.
Specify Your Diesel Power Requirements

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25 H. P. Model 6-A with Radiator and Clutch. New. Immediate shipment.

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SHASTA DAM SAND AND GRAVEL PLANT EQUIPMENT

Including—
GOODYEAR 9-MILE-HAUL 36" SPECIAL CONVEYOR BELTING.
32,000' of Belt Remaining.
With Idlers, Pulleys, and Drives.
ALSO—
Electric Motors, Line Equipment, Transformers, and Supplies.
Pendulum Boom Belt Conveyors, 100' and 200'.
Merrick Feedoweights and Weightometers.
Door Hydroseparator, 20'x4'.
Marcy Rod Mill, 8'x12'.
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Door Rake and Bowl Classifiers.
Extra-heavy Gravel Washer, Trommel type.
Pumps: Centrifugal, Deep-well, Steam, Dredge.
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Pullshovel Attach. for Lorain 75A or B.
1 Yd. P & H Model 600, Comb. Shovel-Crane.
70 Ft. Boom for Northwest, Model 8.
80-ton American Steam Loco., Std. Gauge.
20-ton Plymouth Loco. Gas, Std. Ga.
50 HP Electric Hoists.
1 Yd. Round Shaft Buckets.
1 Yd. and ½ Yd. Dump Buckets.
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McK-T. Pile Hammers, 3, 6 and 7.
10-ton Buf.-Spr. Roller. Gas. 3 Wheel.
55-ton Davenport Steam Loco., Std. Gauge.

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Motors and Generators, A.C. and D.C., for sale at Attractive Prices. Large Stock. New and Rebuilt. All fully guaranteed. Send us your Inquiries.

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100 tons capacity supported by four steel columns with discharge gate 9 feet from grade level. Includes skip hoist in enclosed tower. Can be easily converted to continuous elevator. Heavily built and in excellent condition.

G. & W. H. CORSON, INC.
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300 DEMPSTER-DUMPSTER & BROOKS LOAD-LUGGER BUCKETS & HOISTS

IN GUARANTEED USED CONDITION AT A REAL SAVINGS

GENERAL TRADERS

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Conveyor Belting...Transmission Belting...Elevator Belting...Fire, Water, Air, Steam, Suction or Welding Hose, etc.

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CARLYLE RUBBER PRODUCTS ARE NEW, GUARANTEED & LOW PRICED

CONVEYOR BELTING

ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom	Covers	Width	Ply	Top-Bottom	Covers
48"	8	1/8"	1/16"	20"	5	1/8"	1/32"
42"	5	1/8"	1/16"	20"	4	1/8"	1/32"
36"	6	1/8"	1/16"	18"	4	1/8"	1/32"
30"	6	1/8"	1/16"	16"	4	1/8"	1/32"
30"	5	1/8"	1/16"	14"	4	1/16"	1/32"
24"	5	1/8"	1/32"	12"	4	1/16"	1/32"
24"	4	1/8"	1/32"				

Inquire For Prices - Mention Size and Lengths

TRANSMISSION BELTING

HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	6	10"	6	6"	5
16"	6	10"	5	5"	5
14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

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ENDLESS "V" BELTS

"A" WIDTH All Sizes | "D" WIDTH All Sizes
"B" WIDTH All Sizes | "E" WIDTH All Sizes
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FIRE HOSE

APPROVED SPECIFICATION HOSE
EACH LENGTH WITH COUPLINGS ATTACHED

Size	Length	Per Length
2½"	50 feet	$28.00
	25 "	16.00
2"	50 "	23.00
	25 "	13.00
1½"	50 "	20.00
	25 "	11.00

Specify Thread On Couplings

SPECIAL OFFER . . . HEAVY DUTY
RUBBER HOSE

WATER HOSE
Each Length with Couplings Attached

I.D. Size	Length	Per Length
¾"	25 feet	$4.25
1"	50 "	8.00
	25 "	6.25
1¼"	50 "	12.00
	25 "	7.50
	35 "	10.50
	40 "	12.00
1½"	50 "	15.00
	25 "	10.00
	35 "	14.00
	50 "	20.00

AIR HOSE

I.D. Size	Length	per Length	Couplings
½"	25 feet	$5.00	$1.50 Pair
	50 "	10.00	1.50 "
¾"	25 "	6.25	2.50 "
	50 "	12.50	2.50 "
1"	25 "	10.00	3.50 "
	50 "	20.00	3.50 "

LARGER SIZES ALSO AVAILABLE
All Prices—Net—F.O.B. New York

CARLYLE RUBBER CO., INC.
62-66 PARK PLACE — NEW YORK, N. Y.

24x50 Champion Jaw Crusher rebuilt with new manganese jaws.
24x36 Farrel Jaw Crusher, types A and B.
15x36 Farrel Jaw Crusher with new manganese jaws.
6x36 Farrel Jaw reduction Crusher.
8x36 Acme Jaw Crusher, portable on steel wheels.
13A Telsmith Gyratory Crusher.
3' Symons Crusher, standard.
Barber Greene Bucket Loader with 18" buckets on caterpillars with worm feed and 4 cylinder Buda gasoline Engine, also self starter.
1—Link Belt Bucket Loader with 12" buckets, 3 hp. Electric motor on steel wheels.
24"x5' Traylor, positive drive, heavy duty revolving Screen.
18'x4' Telsmith Ajax revolving Screen.
16'x3' Acme trunnion drive revolving Screen.
12'x3' Symons double deck vibrator Screen.
12'x4' Telsmith double deck vibrator Screen.
10'x5' Niagara single deck vibrator Screen.
1¼ yd. Blaw Knox Clamshell material handling bucket.
2 yd. heavy duty Manganese Shovel Bucket.
14'x30" Lewis Foundry Machine Co., Worm Washer with steel trough.
⅝ yd. Sauerman Dragline hoist with 24 hp. Electric motor.
Double Drum Novo hoist with 50 hp. Novo Gasoline Engine.
66' center 30" Belt Bucket Elevator with 12 ply belt, continuous.
45' center 14" Chain Bucket Elevator with 102 chain, continuous.
30' center 16" Chain Bucket Elevator with 102 chain, continuous.
95' center 36" Belt Conveyor with 8" channel iron frame, with or without belt.
145' center 30" Belt Conveyor with 6" channel iron frame, with or without belt.
116' center 30" Belt Conveyor with 6" channel iron frame, with or without belt.
128' center 24" Belt Conveyor with 6" channel iron frame, with or without belt.
164' center 24" Belt Conveyor with 6" channel iron frame, with or without belt.
112' center 18" Belt Conveyor with 6" channel iron frame, with or without belt.
82' center 18" Belt Conveyor with 6" channel iron frame, with or without belt.
45' center 18" Belt Conveyor with 6" channel iron frame.
160'—111 Rex chain, very good condition.
133'—110 Stephen Adamson chain, like new.

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ATLAS IMPERIAL

200 H.P. Power Unit—Model 6ES-668
6 Cylinder, 514 RPM, Clutch; Heavy Steel Skid Mounted—Stock Delivery

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FOR SALE

New Commercial S. & S. Co Steel Pallets
900—12"x15¾" 3 core code name GRANITE.
50—12"x15¾" 3 core code name GROAT.
50—12"x15¾" 3 core code name GRANGE.

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RELAYING RAILS
(MACHINED STRAIGHTENED)
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Immediate Shipment

MIDWEST STEEL CORPORATION
CHARLESTON — WEST VIRGINIA

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ALL SECTIONS

Also contractors' equipment, "V" shaped and Western cars, 24 and 36-in. gauge, portable track, gas locos, frogs and switches. Attractive prices quoted. Wire, write or telephone for quotations.

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RAILS NEW AND RELAYING
TRACK ACCESSORIES
from 5 Warehouses

L. B. FOSTER COMPANY
PITTSBURGH • CHICAGO • NEW YORK

FOR SALE

2—Type B Jeffrey Hammermills, 42" x 36".
2—150 H.P. 2200 volt, 1160 RPM Motors for above.
1—S x T—11 Pennsylvania Hammermill.
1—150 H.P. 2200 volt 850 RPM Motor for above.
3—36" x 16" Allis Chalmers Crushing Rolls.
2—40 H.P. 220 volt 865 RPM Motors and Drives for above.
4—4' x 10'—Tyler Hummer Screens, Type 38 Single Deck.
Complete Electric Controls for above for 220 volt AC current.
1—4' x 10' Kennedy Vibrating Screen, Double Deck.
1—6' x 20' Simplicity Single Drum Dryer, Diesel powered.

CENTRAL SUPPLY CO.
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Thew-Lorain 75-A Combination Shovel and Crane.

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Thew-Lorain 75-A Shovel.

P&H "400" Combination Shovel and Dragline.

MANLEY SAND COMPANY
ROCKTON, ILL.

FOR SALE

SHOVELS—CRANES

Lambert Elec. Whirley 100 ft. boom, 2 yds. cap.
Monighan-Walker 3½ yd. dragline, elec., rebuilt, guaranteed.
Osgood shovel, 1¾ yd., gas.
P & H Model 765, 3 yd. Diesel shovel, rebuilt.
Bucyrus-Erie 50B steam shovel, high lift.
Marion 37 shovel, steam, 1¾ yds.
Marion Model 450 steam shovel, 1¼ yds.
Marion Model 450 gas-elec. shovel, 1¼ yds.
Marion Model 331 gas shovel.
P & H Model 600A shovel-crane, gas.
P & H 600 crane, 1 yd. capacity.
P & H 650 shovel and dragline, 1¼ yd. capacity.
P. & H. 203A, 3 ton truck crane.
P & H Model 100 6 ton truck crane.
Universal 7½ ton truck crane on Mack truck, rebuilt.
Bucyrus-Erie 50B steam crane, 65 ft. boom.
Bucyrus-Erie 50B steam crane, 70 ft. boom.
Monighan 3½W Diesel dragline, 92 ft. boom.
Osgood shovel, 1¾ yds., gas.
Byers Bear Cat one-half revolving crane.
Marion Model 371, 1¾ yd. shovel and crane.
Bucyrus-Erie Model 37 1½ yd. shovel.
Gantry crane, 5 ton, 46 ft. span, 15 ft. overhang.
Morgan 10 ton, overhead crane, elec., 30'5" span.
Wiley-Whirley Portal crane, 25 tons cap. at 35 ft. radius.
Link-Belt Model K42, 1¼ yd. dragline.

TRACTORS AND MISCELLANEOUS

Allis-Chalmers WS tractor with bulldozer.
Allis-Chalmers HD-14 tractor with bulldozer.
Cletrac 40D tractor with angledozer.
Allis-Chalmers K tractor with bulldozer.
Model 35 Caterpillar with double drum winch.
Int. 1-20 tractor with Hough ½ yd. front end loader.
Allis-Chalmers Model L tractor with bulldozer.
2 Dempster Dumpsters with 20 buckets.
Bucket Elevator, vertical, 35', 22" buckets.
Galion 10 ton, 3 wheel Roller.
Dredge, 12" Diesel Hydraulic.
Dredge, 10" Diesel Hydraulic.
Kennedy-Van Saun Rotary Screen, 4'x8'.
Allis-Chalmers Cent. Pump, electric, 3500 GPM.
Drill Steel, 1¼", bitted and shanked.
500 Drill Bits, 1-R and Timken. Various sizes.
1-R Model 50 Drill Sharpener, complete.
20 Steel Stone Skips, 2-3 yds. cap.
Several dredge pumps available from 6" up.
Building Trusses, 10, span 66 ft. Excellent.
Concrete block plant, 3500 blocks per day.

CONCRETE PLANT AND EQUIPMENT

Butler Bulk Cement car unloader scoop.
Johnson Central Mix Plant, 200 ton aggregate, 1400 bbls. bulk cement.
Butler 65 yds., 4 compt. aggregate bin.
Butler complete ready-mix plant, 450 tons aggregate 300 bbls. bulk cement. A modern plant in all respects, including Whirley crane.
Jaeger 2HCE high discharge 2 yd. truck mixer.
Blaw-Knox Batching Plant, 150 tons aggregate, 300 bbl. bulk cement. Complete unit.
Johnson 200 yd. Octo Bin, 4 compt.
Fuller Kinyon Bulk Cement Unloader, portable.
Koehring 34E Dual Drum Paver.
Fuller Kinyon Type H cement unloader.
Erie Batching Plant, 2 compt. aggregate, one cement.

CRUSHERS—CRUSHER PLANTS

Roll, 54x24, 54x20, 48x36, 30x24.
Al-Chalmers 42" Gyratory.
Gyratory Crusher: K.V.S. 30, 37-S, 49; 32, 8A, 8S; Traylor 8"; McCully, 13", 8", 6".
Allis-Chalmers 6" fine reduction crusher.
Jaw: 6x12, 9x16, 10x20, 14x24, 12x26, 13x30, 16x32, 24x50.
Complete Rock Crushing, Sand and Gravel Plants.

BUCKET—STONE SKIPS

Blaw-Knox ¾ yd. Clam, digging.
Hayward ⅝ yd. Clam, digging.
⅝ yd. Williams Clamshell, digging.
½ yd. Haiss Clamshell, rehandling.
¾ yd. yd. Haiss Clamshell, rehandling.
10 Battleship 2-3 yd. steel stone skips.
Hayward ¾ yd. Standard Orange Peel.

LOCOMOTIVES—CARS

Lima 32 ton 6 wheel steam locomotive.
Porter 42 ton steam saddle tank loco.
Baldwin-Westinghouse 25 ton elec. loco., std. ga.
Baldwin 50-ton, steam Locomotive, with tender.
American 45-ton, steam, Saddle Tank.
Vulcan 30-ton, steam, saddle tank.
Vulcan 25-ton, steam, side saddle loco.
Vulcan 8-ton, std. gauge, gas.
Vulcan 6-ton, gas, 36" gauge.
Porter 12-ton, saddle tank, steam, 36" gauge.
3 Western Steel, 20 yd. Air Dump Cars.

RICHARD P. WALSH CO.
30 Church St. New York, N. Y.

MISCELLANEOUS

Williams 2 yard rehandling clamshell bucket
Hayward 1½ yard rehandling clamshell bucket
5 magnetic 36" dia. pulleys, 18" and 36" faces
Chicago NSB 14"x12" air compressor, 529CFM
Chicago NSB 7½"x6" air compressor, 107 CFM
Gardner-Denver duplex air compressor, 6"x6", 107CFM
National double drum hoist, 25 HP electric
M-M single drum and swinger 25 HP electric hoist
Gasoline locomotives, 36" gauge, 4 and 8 tons
Six 36" gauge one yard side dump Koppel cars
Waukesha 4 cyl. 15 HP with 14-1 speed reducer
Centr. pump, 25 HP electric, 750 gpm, 90' head
V belt drive pulleys, up to 400 HP
Two centr. vertical pumps, 15 HP electric, 1000 gpm
Silent Chain Carpuller, 10 HP DC electric
New bin gates, 12"x12". 10 speed reducers

BUCKET ELEVATORS, CHAINS, PARTS

14" continuous bucket chain elevator, 50'
14" continuous bucket belt elevator, 45'
12" bucket elevators on chain, 35' to 60'
6" bucket elevator on chain, 25' center
Encased and open bucket elevators
Grain elevators, buckets 5" to 18", on belt
New and used roller chain and sprockets

BELT CONVEYORS AND ACCESSORIES

36"x225' Robins belt conveyor, anti-friction idlers
Equipment for 700 feet of 30" belt conveyor
24"x150' belt conveyor, plain bearings
20"x60' Slat conveyor on roller chain
16"x42' trough scraper conveyor with steel frame
Merrick Weightometers for 20" and 30" belt
48" wide 8 ply conveyor belt, 1800'
30" wide 6 ply conveyor belt, 750'
New and used conveyor belt
Automatic Trippers for 14", 16", 18", 24", 30" belt
Robins Hand Operated 30" belt trippers
Screw and gravity conveyors

CRUSHERS, ROLLS, MILLS

Cedar Rapids 15"x24" jaw crusher
Traylor, type "H" 10"x16" jaw crusher
Scholl 9"x16" jaw crusher for heavy duty
New England 11"x20" jaw crusher
Acme 12"x22" jaw crusher
Wheeling 12½ jaw crusher, 9"x15"
Allis-Chalmers 3D gyratory Fine crusher
Traylor "BULLDOG" 11" gyratory crusher
Link Belt 24" single roll coal crusher
Robins 24"x30" double roll coal crusher
Allis-Chalmers "B" 42"x16" double roll crusher
New Holland 10"x16" double roll crusher
American Standard 24" disintegrator
Furnace Eng. Co. hammermill for coal
Sturtevant Mill "Rotary Fine Crusher 20"
Stedmans type "B" 20"x16" Rolling Ring crusher
Gruendler No. 16-40 "ARISTROCRAT" grinder
Mid-West No. 2 Pulverizer
Steel Balls, from 2" down; 8 tons

VIBRATING AND REVOLVING SCREENS

Simplicity three deck, 3'x6' vibr. screen
Perfex single deck 4'x7'x6" shaker screen
Allis-Chalmers two deck 3'x8' vibr. screen
Allis-Chalmers two deck 4'x10' vibr. screen
Robins "GYREX" two deck 4'x10' vibr. screen
Leahy single deck 4'x9' heavy duty vibr. screen
3 Hummer single deck 3'x5' vibr. screen
2 Hummer single deck 4'x5' vibr. screen
1 Hummer single deck 4'x7' vibr. screen
Tyler 15 cycle generators, belt & motor driven
Revolving screens: 4'x22'; 5'x18'
S-A Conical screen, 28" and 44" dia., 54" long

G. A. UNVERZAGT & SONS
136 Colt St., Irvington, N. J.

AIR COMPRESSORS

BELTED: 355, 528, 676, 1000, 1200 & 1570 Ft.
ELECTRIC: 478, 676, 897, 1282, 1722 & 2290 Ft.
DIESEL: 603, 807 & 1060 Ft.
PORTABLE GAS: 110, 160, 230, 310, 540 & 1300 Ft.
STEAM: 49, 310, 528, 1300, 2290 & 3600 Ft.

CLAMSHELL BUCKETS, SKIPS & GRAPPLES

Owen R A & H Stone Grapples.
2 Yd. OWEN Type S Material Handling.
1¼ Yd., 1 Yd. & ¾ Yd. HAYWARD Class E.
12 Steel Skips 6½ x 6 x 2½.
5 Ton Bucyrus Rock Grabs.

CRANES AND DRAGLINES

1—16 Yd. 180' Boom Electric Caterpillar Dragline.
¾ Yd. 5 Ton O & S 30 Ft. Boom.
12 Ton NORTHWEST 50 Ft. Boom Gas.
20 Ton LIMA, 750 Diesel, 65 Ft. Boom.
25 Ton BROWNING & 30 Ton AMERICAN Loco.
25 Ton LINK BELT K-42 Electric, 70 Ft. Boom.

CATERPILLAR SHOVELS

2 Yd. Marion Steam Shovel.
¾ Yd., 1¼ Yd., 2 Yd. & 4 Yd. MARION Electrics
1 Yd. NORTHWEST Gas.
1¼ Yd. LIMA Diesel.
1¼ Yd. BUCYRUS 41B Steamer.
4 Yd. Bucyrus 120B Electric. Also 3 yd. Erie Elec.
5 Yd. P & H Model 1500 Elec.

DUMP CARS

46—KOPPEL, 1¼ Yd. 24 & 30 In. Ga., V Shaped.
15—2 Yd., 3 Yd., 4 Yd., 6 Yd., 12 Yd., 36 In. Ga.
20—Std. Ga. 12 Yd., 16 Yd., 20 Yd. & 30 Yd. Cap.
15—Std. Ga. 50 Ton Battleship Gondolas.

BOX, FLAT & TANK CARS

9—50 ton std. ga. heavy duty flat cars.
30—8000 gal. cap. tank cars.
30—40 ton std. ga. box cars.

HOISTING ENGINES

Gas: 15, 30, 60, 100 & 120 HP.
Electric: 30, 52, 60, 100 & 150 HP.
Steam: 6½x8, 7x10, 8¼x10, 10x12, 12x24.

DIESEL UNITS

75, 90, 180, 200 HP. F. M. Engines.
175 KVA Worthington 3/60/2300.
375 KVA Fairbanks 3/60/2300.
343 KW, Fairbanks-Morse 3/60/480 V.

BALL, ROD AND TUBE MILLS

5'x22" HARDINGE CON. Dry Ball Mill.
6'x22" HARDINGE CONICAL Pebble Mill.
8'x22" HARDINGE CONICAL Ball or Pebble Mill.
4x8, 8x6 & 10x9 Straight Ball Mills.
4x16, 5x18 & 5x22 Tube Mills & 6'x22'.
3½x8 & 5x7 Air Swept Tube Mills.
2x4½, 6x12 & 5x13 ROD MILLS.

PULVERIZERS

JEFFERY, 24x20 & No. 1 Sturtevant Ring Roll.
RAYMOND Auto Pulverizer No. 0000, 0 & 3.

STEEL STORAGE TANKS

10,000 Gal., 15,000 Gal. & 20,000 Gal. Cap.

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8, 10 and 14 ft. Separators, Gayco & Bradley.

ROLL CRUSHERS

36x60 Fairmount & 36x20 Diamond.

JAW CRUSHERS

10x8, 12x7½, 14x7, 15x9, 15x16, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 26x12, 30x15, 30x15, 36x15, 36x30, 36x15, 54x14, 36x9, 36x6, 30x10, 36x24, 42x9, 48x34, 48x36, 60x42, 84x60, 36x16, 9x36.

CONE & GYRATORY CRUSHERS

5 No. 10, 25, 37 & 49 Kennedy.
18 in. 24 in., 30 in., 36 in. & 48 in. Symons Disc.
4—10 T2 Traylor 4 ft. Gyratory.
4—Nos. 5, 3 & 6 Austin Gyratory.
2—Traylor T-12 Bulldog Gyratory, also 16 inch & 8 in. Traylor T. Gyratory.
17 Gates K—Nos. 2, 4, 5, 6, 7½, 8, 9½ & 21.
7—Symons Cone, 2 3, 5½ and 7 ft.
6, 10 & 13 Inch Superior McCullys.

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BELT: 1000 Ft. 60 In., 700 Ft. 40 In., 600 Ft. 36 In., 805 Ft. 30 In., 1642 Ft. 24 In., 517 Ft. 20 In., 297 Ft. 18 In., 500 Ft. 16 In., 300 Ft. 14 In.
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Head & Tail—Pulleys—Takeup for all sizes.
Steel Frames: 2,000 Ft. 24 In., 30 In. & 36 In. Sections

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36 In.x20 Ft., 2 Ft.x30 Ft., 4 Ft.x30 Ft., 54 In. x30 Ft., 42 In.x34 Ft., 5 Ft.x30 Ft., 5 Ft.x16 Ft., 5 Ft.x60 Ft., 6 Ft.x60 Ft., 6 Ft.x20 Ft., 6 Ft.x70 Ft., 10x30, 7½x100 & 8x110 Ft. Kilns.

STEEL DERRICKS

GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom.
STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom, 25 Ton 100 Ft. Boom, 75 Ton 135 Ft. Boom.

LOCOMOTIVES

GASOLINE: 3 Ton, 5 Ton, 8 Ton, 12, 14, and 20 Ton.
STEAM: 9 Ton, 20 Ton, 40 Ton, 60 Ton & 80 Ton.
ELECTRIC: 2 Ton, 5 Ton, 8 Ton, 40 Ton.
DIESEL: 4, 8 & 15 Ton.

SCREENS

VIBRATING: 2x4, 3x6, 12x5, 2x3, 3x5, 4x5, 4x8, 4x10, 4½x7, 4x15, 1, 2 & 3 Deck.
HUMMER, ROTEX, NIAGARA & ROBINS.
REVOLVING: 3x12, 3x16, 3½x16, 3x24, 4x16, 4x30, 4x23, 4x24, 5x30, 5x20, 6x20.

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3 FT. SYMONS SHORTHEAD CONE CRUSHER
Fine Bowl

Complete with 75 H.P. electric motor. Particularly adapted for making a lot of ¾" rock. Thoroughly reconditioned—prompt shipment.

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180 H.P., Bessemer, 2 cyl., horizontal, complete. With or without 100 K.W., 250 volt DC Generator. Very attractive price.

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705 First National Bank Bldg.
Pittsburgh 22, Pa.

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Approximately 6,000 12x16 steel cored pallets.

CONCRETE & CINDER BLOCKS PRODUCTS CO.
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Genesee 2121

FOR SALE: Besser Super K3 Tamper; automatic pallet feeder, vibrating mold; power and gravity conveyors; air hoist; 2-3-4-6-8-10 and 12"; 6-8" header; chimney mold; industrial cars; 4500 steel pallets; transfer cars and rail; industrial Brownhoist mixer 60 cu. ft. spare parts; all motors, starters, counter shafts and belting; Winkler stoker; Barber-Greene model 42 bucket loader. Write Box D-1, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

—FOR SALE—

FAIRBANKS-MORSE
Diesel Generator Unit
120 H.P. Heavy Duty, 90 KVA
3/60/240 Complete
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READY-MIX PRE-MIX PLANT
MODERN AND COMPLETE PLANT

Just released from rental to the U. S. Engineers. All-electric in A-1 condition. F.O.B. our plant, Milwaukee, Wis.

2—Two yd. RANSOME stationary Mixers.

1—225 x 24" ATLAS anti-friction belt conveyor with combination truck and car unloading hopper and ground controlled distributing spout.

1—Cement bin, 280 bbl., BUTLER, cylindrical type with elevator. Three cement screws—67', 26' and 30', to convey from cement bin to batch-in plant.

1—175 cu. yd. BUTLER 3 compartment steel bin.

Complete with electric motors, switches, starters, wiring, weigh batchers, water measuring tank, chutes, spare parts, etc.

HUNTER TRACTOR & MACHINERY CO.
327 So. 16th Street Milwaukee 3, Wisc.
Orchard 6580

FOR SALE
COMPLETE BLOCK PLANT

Including brick building 131 feet long with concrete floor, two car sand pit under roof, and large lot. Located in Kentucky town of approximately 10,000 population. Only plant in county of 40,000

Plant consists of 2 Dun Shovel Mixers with Skip Hoist. One Kirkham Vibrator with 8x8x16 and 8x4x16 molds with attachments for specials. Used only 6 weeks. 21 Steel Racks (48 block capacity each). 1050 pallets. Two electric motors. One 10 HP—One 1½ HP complete with starter switches. Barrett Life Truck. 4 Sewer Molds, and steel tank for oiling pallets. Plant now producing 800 to 1,000 blocks per day and three weeks behind on orders.

Price including Building and Lot $10,000.00 Write Box C-99, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

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High Calcium Limestone Deposit and Lime Plant in Eastern U.S.A. Location favorable to the Agricultural, Building, Chemical and Steel trades.

Write Box D-3, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Illinois.

— EQUIPMENT WANTED —

WANTED

One Single Roll Crusher
McLanahan P 7, 8 or 9
or equivalent
One Hammer Mill Dixie 3040
or equivalent
Two Steel Bins, 15x25'
or equivalent
One 200' ctoc Belt Conveyor 36" wide
One 100' ctoc Belt Conveyor 24" wide
One 250' ctoc Belt Conveyor 18" wide
with or without Belting

THE BLACK WHITE LIME CO.
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QUINCY, ILLINOIS

WANTED TO BUY:
Good, modern roller bearing jaw crusher, 24x36 or larger, in which case we will have:
FOR SALE:
18x36 roller bearing Universal jaw crusher, first class condition.
COOGAN GRAVEL COMPANY
PEORIA, ILLINOIS

WANTED

18 2-yard Granby type steel dump cars for 36" gauge.
Write Box C-94, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

WANTED

Page Walker Dragline, with 130 ft. boom—8 yd. Page Dragline Bucket. Powered with Diesel Engine, preferably Page Diesel.
R. E. BOGGS
1427 South 18th Street
Birmingham 5, Alabama

WANTED

Brick Press in first class condition —also cylinder for curing brick.
EL PASO BUILDING MATERIAL CO.
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MINERAL COLORS
for
CEMENT-PLASTER-STUCCO CONCRETE PRODUCTS
"FINE BECAUSE OF THEIR FINENESS"
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HENRY, VIRGINIA

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Analytical and Consulting Chemist
323 Main St. Danbury, Conn.

Specialty—The Chemical Analyses of Carbonate, Phosphate and Silicate Rocks and Mineral Products.

Wanted to buy either a direct or semi-direct heat rotary dryer of approximately 5'x45' and located in the southeast.
Write Box D-6, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

WANTED

No. 15 Gyratory Crusher.
5' Symons Crusher.
20 lb. USED RAIL.
EQUIPMENT SALES & ENGINEERING CO.
33 N. La Salle St. Chicago, Ill.

WANTED

Hand operated crane on runway, about 4 tons capacity, about 20 ft. span, 20-22 ft. ground to hook.
P. O. BOX 246
Waltham, Massachusetts

WANTED

2 or 2½ yd. shovel, Diesel, gas or electric.
2½ yd. dragline, Diesel, crawler type.
Jaw Crusher—36"x48", or larger.
Gyratory Crusher, Superior McCully, 20".
Locomotives, gas, std. ga., 36, 20 & 12 tons.
Symons 5½' cone crusher. Service trencher, 12'.
14-ton 42" ga. steam S/T locomotive.
H. Y. SMITH CO.
828 N. Broadway Milwaukee 2, Wis.

WANTED

Cement Block Making Equipment.
Give full particulars and price.
Gillies Cement Block Work
Galt, Ontario, Canada

—CONSULTING ENGINEER—

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CEMENT ENGINEER
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POSITIONS VACANT

WANTED

Middle West Portland Cement Manufacturer wants aggressive young engineer with experience in plant lay-out, construction and operation. Permanent position with excellent possibilities for right man.

Write Box C-100
c/o Rock Products
309 W. Jackson Blvd.
Chicago 6, Ill.

WANTED PLANT SUPERINTENDENT

Familiar with pipe, block or any special concrete product. Must have at least high school education, be mechanically inclined and have pleasing personality. Age limit 48. Post-war opportunity with large concern branching out into full line of products in various sections of the United States and operating on an incentive profit sharing plan. Past record must stand rigid inspection. Include photograph in reply. Write Box C-62, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

SUPERINTENDENT WANTED

Portland cement manufacturer has opening for Plant Superintendent. Permanent position with old established company. Our own people know of this ad. In replying give age, education, experience, salary requirements and references.
Write Box C-77, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

WANTED—Assistant Superintendent for industrial sand plant located in Middle West. Must be able to handle maintenance and repair, also personnel matters. Plant will consist of modern equipment. State salary expected, submit complete details of qualifications and references in first letter. Write Box C-73, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

CHIEF CHEMIST for Central American Wet Process Rotary Kiln Cement Plant wanted. Knowledge of Spanish preferred. Housing facilities and good salary. Write Box D-4, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

WANTED

Plant superintendent for open pit mining operation located in middle south. Must be familiar with operation and maintenance of power shovels, caterpillar tractors, trucks, and pit drainage problems. Must be familiar with storage, crushing, elevating, and conveyor equipment as well as Raymond pulverizers. Must also be qualified to supervise office and field laboratory work. Should be an engineering graduate but this not essential if practical experience broad enough. Please send picture, state salary expected, and detail qualifications in first letter. Write Box D-3, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

POSITIONS WANTED

READY-MIXED CONCRETE, SAND AND GRAVEL PLANT SUPERINTENDENT AND GENERAL MANAGER AVAILABLE

After 20 years' experience as operating head for outstanding U. S. and foreign ready-mixed concrete and sand and gravel operations am anxious of locating in one spot with reliable, well-established owners. Willing and able to accept full responsibility for all phases of operations. Can organize new operation or reorganize old operation for right people.
Write Box D-2, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

POSITION WANTED — Honorably discharged Army Captain, age 37, desires position of a supervisory or executive nature with opportunities for advancement in a Portland cement firm. Fifteen (15) years' cement mill experience as control chemist, research chemist, and general plant foreman in modern cement plant. Four (4) years' Army experience in an administrative capacity, 2½ years' experience in plant management of large munition loading facility and 1½ years' experience as production engineer on three of the major incendiary bomb programs. Write Box C-91, c/o Rock Products, 309 West Jackson Blvd., Chicago 6, Ill.

CEMENT CHEMIST desires position as Chief or Assistant Chief. Married, eleven years' experience in cement industry with Pozzolan, High Earley, Oil Well, and Masonry Cements. Employed but wish to make change. Write Box D-5, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

POSITIONS WANTED—Cont'd

LIME MANUFACTURING EXECUTIVE—Twenty-three years in lime industry as plant manager-superintendent. Can design, erect, and operate kilns either on producer or natural gas. Many years' mining experience, also design and operation of crushing and fine-grinding plants. Well known in industry. If low costs, close production control, proper design and operation of equipment, and intelligent labor management are desired, should like to make contact. Now employed but available. Write Box C-72, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

POSITION WANTED: Superintendent of sand and gravel plant. Twenty years' experience. Age 42 years, married and in good health. Can handle and repair all types of equipment. Write Box C-96, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Illinois.

EXPERIENCED cement mill engineer desires position as assistant superintendent with company located in west or middle west. Well grounded in maintenance, operation and design. Write Box C-98, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

CEMENT ENGINEER with several years' experience in the design, construction and operation of portland cement plants. Desires a position as chief engineer with a cement company or allied industry. Write Box C-92, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

POSITION WANTED—Rock Plant, Quarry and Hot Plant Supt. Twenty years experience with either portable or stationary plants, desire connection with good company, overseas or in States. Can handle wet or dry plants. Write Box C-64, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

CHIEF CHEMIST—twenty years' experience in Portland Cement Industry wishes to locate on west coast in modern cement company or partnership in research laboratory. Write Box C-95, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Illinois.

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LONG ESTABLISHED REPUTABLE CONCERN WITH SUBSTANTIAL CAPITAL

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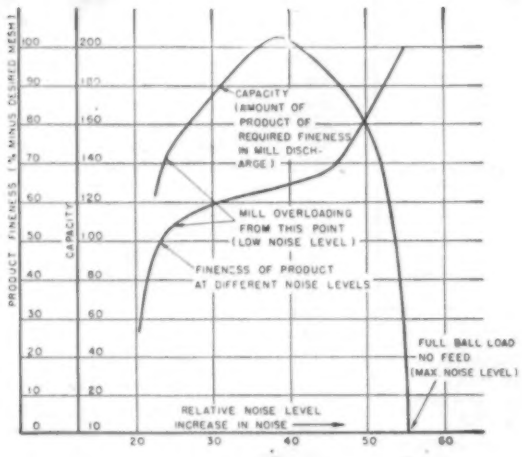
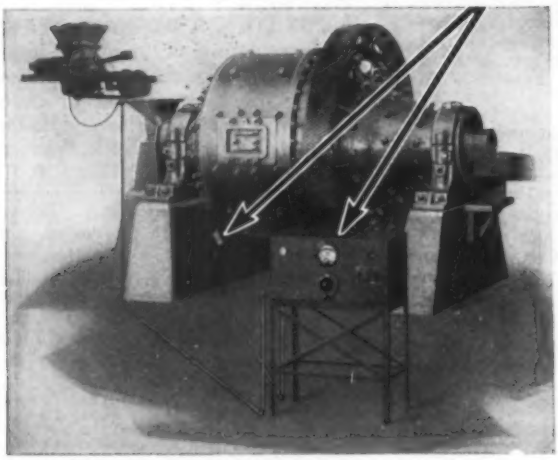

PRODUCT FINENESS (% MINUS DESIRED MESH)
CAPACITY
CAPACITY (AMOUNT OF PRODUCT OF REQUIRED FINENESS IN MILL DISCHARGE)
MILL OVERLOADING FROM THIS POINT (LOW NOISE LEVEL)
FINENESS OF PRODUCT AT DIFFERENT NOISE LEVELS
FULL BALL LOAD NO FEED (MAX. NOISE LEVEL)
RELATIVE NOISE LEVEL INCREASE IN NOISE

*Reg. U. S. Pat. Office **"ELECTRIC EAR"***



assures 10 to 15% more capacity

from Ball, Pebble and Tube Mills

The above chart shows relation of noise level to fineness and capacity when grinding in open circuit. The "Electric Ear" will maintain maximum capacity by reducing or increasing the feed rate to compensate for changes in grinding characteristics of the material resulting from bin segregation, moisture, and hardness of the material.

When grinding in closed circuit a constant noise level assures peak capacity at a given fineness.

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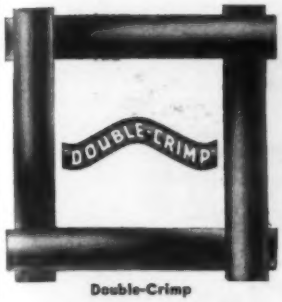
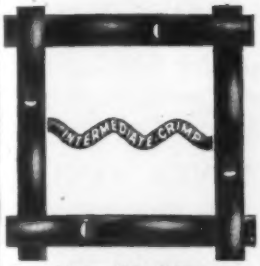


Double-Crimp

Arch-Crimp



Intermediate-Crimp

Flat-Top

"The Perfect"

Wire Cloths and Screens

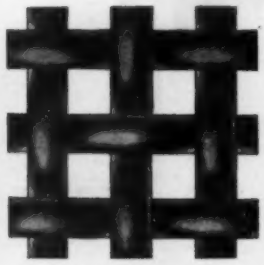
We have been specialists for many years in the making of precision wire cloths, wire screens and woven wire products.

We apply our same precision principles in fabricating wire cloths into finished industrial units, for production or processing equipments or for permanent parts of countless industrial products.

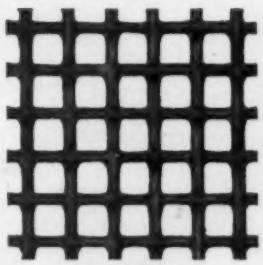
We invite your inquiries for wire cloths of all commercial metals or alloys or weaves, in continuous lengths or cut to size, or processed to meet your individual requirements.

"Perfect" alloys and metals	"Perfect" Wire Cloth weaves	"Perfect" Wire Cloth processing	"Perfect" Wire Cloth products
Super-Loy	Arch-Crimp	Bending	Baskets
Steel	Coiled	Binding	Circles
Galvanized	Double-Crimp	Brazing	Cones
Tinned	Double-Fill	Calendering	Crates
Stainless Steel	Dutch	Clinching	Cylinders
Nickel-Chromium Alloys	Filter	Cutting	Discs
Aluminum	Flat-Top	Dipping	Forms
Brass	Herringbone-Twill	Dishing	Leaves
Bronze	Intermediate-Crimp	Flanging	Lengths
Commercial Phosphor	Rek-Tang	Flattening	Panels
Copper	Selvage-Edge	Forming	Pieces
Monel Metal	Straight-Warp	Framing	Racks
Nickel	Stranded	Galvanizing	Ribbons
Any special alloys available in rod or wire form	Sta-Tru	Painting	Rolls
	Triple-Warp	Shearing	Sections
	Twilled	Slitting	Segments
	Twisted-Fill	Trimming	Spacers
	Twisted-Warp	Arc-Welding	Strips
		Gas-Welding	Template shapes
		Spot-Welding	Trays

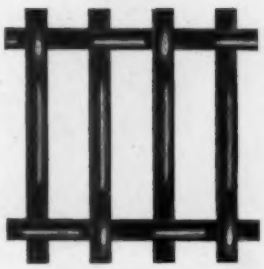
We will follow your specifications and blue-prints exactly as your production engineers have prepared them—or we will submit suggestions for your approval.



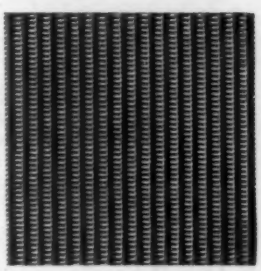
Double-Crimp



Galvanized



Rek-Tang

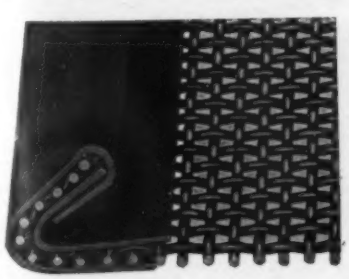


Dutch Weave

The LUDLOW-SAYLOR WIRE COMPANY

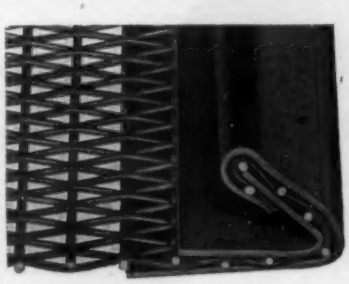
Newstead Avenue & Wabash Railroad

ST. LOUIS 10, MO.



LUDLOW-SAYLOR PRECISION FABRICATING makes vibrating-screen decks and jackets that are easily handled—quickly installed—need fewer adjustments and renewals.

Illustrations suggest only a few of the many available types of wire cloth and woven wire screens which may be custom-finished with attachments to fit your particular processing installations.



This Power Clutch NEVER "Takes Over"

RETAINS "FEEL" OF THE LOAD

Unlike a booster clutch, which gives the operator no more than "on-or-off" control, the Koehring 605 Power Clutch never takes over. Simple linkage maintains constant control over the main clutch band. Complete control is maintained over the in-between stage, between full engagement and full disengagement. There is no continuous slipping booster, no complicated, sensitive network of air lines.

ONE-TENTH THE LEVER PULL

In all operations, a light lever pull sets this powerful 37-inch clutch—only 1/10 the pull required to set a manual clutch of comparative size.

AUTOMATIC HEAT ADJUSTMENT

Continuous, time-consuming adjustments for heat expansion are unnecessary on the Koehring Power Clutch. A large compensator spring automatically makes the required tension changes.

KOEHRING COMPANY
MILWAUKEE 10, WISCONSIN

KOEHRING
605

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

BECAUSE OF Emeralube*
TRU·LAY Preformed I.P.S.
LASTS LONGER ...
Every strand is literally stuffed with Emeralube the longer-life lubricant
*Improved Plow Steel

● The green lubricant which is stuffed into every strand of American Cable **TRU•LAY** Preformed Wire Rope made of Improved Plow Steel makes that record-breaking rope *still* better. Why—? Because *Emeralube*, made to our specifications, clings to the inner wires better, doesn't work out, keeps every wire free from corrosion and able to slip past one another without undue friction. This means longer rope life, better rope service, greater dollar value.

Regardless of the job — for your next rope specify TRU•LAY Preformed *Emeralube*. Then you will appreciate the multiple advantages of the best wire rope you can buy.

ACCO

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma, Bridgeport, Conn.

AMERICAN CABLE DIVISION
AMERICAN CHAIN & CABLE

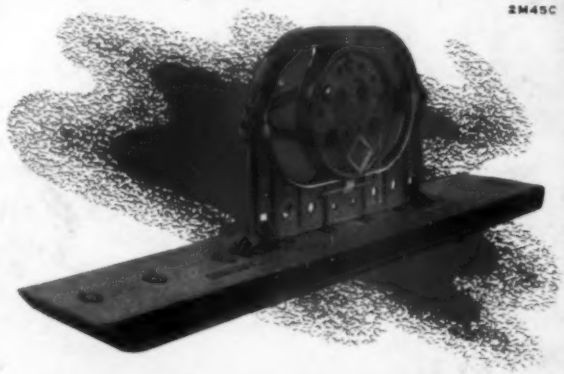
TRADE MARK

In Business for Your Safety

Winning Phosphate Output in a Walk!

High water table means a soft, fully-sloughing surface which is one of the big problems in open pit phosphate mining in Florida. For profitable output under these conditions, many leading companies have selected Bucyrus-Monighan and Bucyrus-Erie walking draglines. These "years ahead" machines operate on big-area bases ideal for soft-ground performance. They have smooth rolling-cam walking traction which permits easy moving over soft or rough ground, and side-stepping in any direction to avoid trouble. Long booms fit stripping and matrix-handling; strong, simple construction keeps maintenance costs low. Easy, responsive controls permit the operator to make full use of the speed and balance built into digging, hoisting, swinging, and dumping motions. Available with booms to 250 feet and buckets to 50 yards, these walking draglines have proved their leadership in difficult work all over the world.

2M45C



BUCYRUS-ERIE

South Milwaukee, Wisconsin